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LOOK^r to your health; and if you have it.
praise God and value it next to a good
conscience; for health is the second blessing
that we mortals are capable of—a blessing
that money cannot buy; therefore value it, and
be thankful for it.

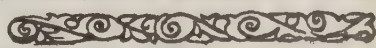
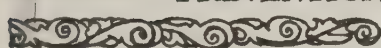
—*Izaak Walton.*



A. N. JENKS, D.D.S.
President, Montreal Dental Club.

ORAL HEALTH

*A JOURNAL THAT STANDS FOR THE OUNCE OF
PREVENTION AS WELL AS THE POUND OF CURE*



Vol. 17

TORONTO, JANUARY, 1927

No. 1

Proceedings of the Montreal Dental Club Second Annual Fall Clinic, November 1st, 2nd, 3rd, 1926



THE Second Annual Fall Clinic by the Montreal Dental Club was held in the Mount Royal Hotel, Montreal, during the first week in November, 1926, and was an unqualified success, both as to numbers and scientific interest. In addition to the members of the Club, and their Montreal confreres, there were many registrants from points beyond the City, including the following:

Dr. R. H. Bernard, Keene, N.H.; Dr. M. E. Adams, Magog, P.Q.; Dr. W. A. Armstrong, Ottawa, Ont.; Dr. S. G. McCaughey, Ottawa, Ont.; Dr. J. E. Taggart, Burlington, Vt.; Dr. C. I. Taggart, Burlington, Vt.; Dr. W. S. Allen, Sherbrooke, P.Q.; Dr. E. Beaulieu, Quebec, P.Q.; Dr. A. F. Pottle, Meredith, N.H.; Dr. E. H. Robertson, Boston, Mass.; Dr. Wallace Secombe, Toronto, Ont.; Dr. L. E. MacLachlan, Ottawa, Ont.; Dr. J. W. Rooney, Quebec, P.Q.; Dr. J. H. Symons, Waterloo East, P.Q.; Dr. F. Bradley, Sherbrooke, P.Q.; Dr. J. J. Lonergan, Ottawa, Ont.; Dr. W. R. Mackay, Rock Island, P.Q.; Dr. G. Hale, St. Lambert, P.Q.

The *Montreal Star* made editorial comment on the meeting, and referred to the fact that, while the "man in the street" pays little attention to the deliberations of dental societies, the discussions of such bodies may well be of real significance to the public, and continued: "Within thirty years, the science of Dentistry has done much to mitigate the sufferings of humanity. Discoveries that many ills, the causes of which were obscure and which were variously attributed to alien conditions, are in reality the direct outcome of the seepage of poison from diseased teeth or diseased gums into the body, have resulted in a complete change in the treatment of several illnesses. While the dentists have not accomplished this unaided, the most important work of definite diagnosis has been achieved by them, and medical science is that much in their debt. Forty years ago, people cared for their teeth much as they returned to close a gate—as an afterthought. To-day all sensible people attend to their teeth as one of the elementary necessities of good health."

The officers, committees and members of the Montreal Dental Club are to be congratulated upon the success of the Fall Clinic, the proceedings of which follow.

* * *

Dependable Amalgams and their Operating Demands

WM. E. HARPER, D.D.S., CHICAGO, ILL.



AMALGAM—the most used, the most abused, the least understood and written about. Notwithstanding these unfavourable conditions, a century of service reveals amalgam as the most dependable filling material, when and where its use is indicated.

Amalgam is the only reasonably permanent filling material possessing power to inhibit decay; this germicidal power has made it possible for us to save the teeth, irrespective of difficulties of access, inability to keep the cavity dry during the insertion of the filling, neglect of the teeth by the patient, unfavourable environment, time developing faults in the material, or operative defects in and about the fillings.

With such a record of service, is it not time that we apply ourselves to the study of its operative needs?

We have now available a proved, practical operative procedure by which means we may eliminate most of the discrediting faults characteristic of poor amalgam work. It requires no more time or skill to make a permanently good amalgam filling than is required to make a bad one, in the hands of men who strive to render the best possible service to the public.

As evidence of the great need and the improvement it is possible to make by the use of a correct amalgam technique, I quote the following from my records:

Prior to the development of the correct amalgam technique, a record of one thousand test fillings, made by representative amalgam operators throughout the U.S. and Canada and myself, revealed over ninety-five per cent. of leaking, weak and unstable fillings when submitted to the necessary tests, and these results have been verified by every investigator undertaking and equipped to do the same line of test work.

During the past two years, at clinics I have given, I have made in public demonstration two hundred and nine test fillings, only one of which leaked when tested immediately under five pounds continuous air pressure.

The ninety-five per cent. of leaking fillings, tested before shrinkage and expansion could occur, conclusively prove the use of a faulty amalgam procedure.

The ninety-nine per cent. of non-leaking fillings conclusively prove

the merit of the correct amalgam procedure I will present. These results I have publicly demonstrated and stand ready to repeat.

Alloys made by reputable manufacturers containing 65 to 70 per cent. of silver may be considered high grade. Alloys containing less than 65 per cent. of silver generally shrink too much, and are commonly weak in their resistance to crushing stress and flow. Alloys containing more than 70 per cent. of silver work too harshly and set too quickly for use by the average operator. The slow setting alloys are so deficient in many essential qualities and are so wasteful of the operator's time, that I do not feel that they are worthy of consideration at this time.

To make a non-leaking, strong and stable amalgam filling, there are four requirements of sufficient importance to be considered fundamental, namely:

A high grade alloy, quick or medium setting.

A complete mix.

Adaptable plasticity, in contra-distinction to workable plasticity.

Thorough, equal and forcible packing.

These fundamentals must be understood and applied to secure reasonably uniform and perfect results.

Alloys are made quick and medium setting. Rapid and skilled operators may use the quick-setting alloys. Average slow or slow operators must use the medium alloys to be assured the necessary time for thorough manipulation.

Over 95 per cent. of our amalgam fillings leak the moment they are inserted. This is conclusive evidence that the faults are operative, not shrinkage and expansion, which time alone could develop.

Over 50 per cent. of our amalgam fillings crush under very low pressure and flow dangerously.

All of these faults may be easily corrected by operators of average ability and skill, by the use of a correct amalgam technique.

Dangerous shrinkage and expansion in amalgam fillings made with high-grade alloys is always and only the result of a faulty amalgam technique.

During amalgamation (mixing) we always have shrinkage; as setting predominates we have expansion. If the amalgamation (mixing) be made sufficiently complete in the mortar, practically no amalgamation remains to take place in the finished filling to cause shrinkage and expansion.

Amalgamation develops the following reaction: dental alloy, largely Ag_3Sn , combines with the mercury as indicated by the equation: $\text{Ag}_3\text{Sn} + 4\text{Hg} = \text{Ag}_3\text{Hg}_4 + \text{Sn}$ and remaining excess mercury. During this physical change we always have shrinkage.

Mixing in the mortar develops this reaction, and the temperature of the mouth will develop the same reaction in the finished filling, if unamalgamated alloy particles and much excess mercury remain, causing

a secondary shrinkage and expansion in the finished filling. This is the source or cause of dangerous movement that time may develop.

Rapid rubbing for two or three minutes in a slightly dulled, deep glass mortar, with a pestle shaped to make contact with the curved bottom and the full depth of the sides of the mortar, are the imperative requirements for a complete hand mix.

Shallow mortars and short, poorly-shaped pestles prohibit a complete mix, and I emphatically condemn their use.

A mortar and pestle of proper size and shape are of first importance; a means to accurately measure the time of mixing (two or three minutes) is of second importance; and both are absolute requirements to results. This simple detail of operative procedure is woefully neglected, and accounts for those failures that time develops in our amalgam work.

PLASTICITY.

Insufficient plasticity has been the rock on which we have wrecked 70 to 80 per cent. of our amalgam fillings.

Adaptable plasticity of the amalgam when packed against cavity walls and margins is the most important detail of operative procedure necessary to adaptation.

The profession has failed to make the distinction between a workable plasticity and an adaptable plasticity. This distinction must be recognized to insure the necessary plasticity.

An ordinary mix of a quick setting alloy remains workably plastic one to eight minutes; within this time it remains adaptably plastic two to three minutes only, and in the average large or large proximo-occlusal cavity two to three minutes is insufficient time in which to apply a thorough packing technique. To increase this too short packing time, we mix quick-setting alloys decidedly plastic, retaining the excess mercury until adaptation is secured, after which it may be readily removed by forcible and orderly packing.

We may build fillings to perfect form with a workable plasticity, but we must have adaptable plasticity to make a non-leaking filling.

Crepitus indicates loss of adaptable plasticity, although the mass may remain easily workable and appear to be smoothly plastic.

TAMPING.

Tamping in its effect and purpose is similar to agitation or jarring a plastic mass. Tamped amalgam settles or flows into angles and against cavity walls as a uniformly dense layer, free of air voids and cracks, retaining its original plasticity as it is manipulated to exact place. All that now remains to be done is to compress it forcibly to remove the excess mercury and wedge the amalgam into pressure contact with the cavity walls, at which moment it will immediately harden and stay put.

When amalgam is packed to place by force, instead of by tamping, it perceptibly stiffens with each thrust and loses its adaptable plasticity before adaptation is secured, and a leaking filling is the result.

By tamping we may place and build the amalgam into immediate contact with the cavity walls and well into all angles without crack or break, free of all air voids, retaining its original plasticity during this manipulative process. Compression destroys plasticity; tamping increases plasticity. For this reason we should tamp instead of using forcible packing in placing and building the filling. The purpose of forcible packing is to remove the tin and excess mercury, and finally wedge the amalgam into the tightest possible pressure contact with the cavity walls.

CONDENSATION.

Very few amalgam operators pack amalgam with sufficient force to develop pressure contact of the amalgam to cavity walls and remove reasonably well the excess mercury and unattached tin. A weak, leaking and unstable filling is the result.

A filling to be uniformly strong and perfect must be packed with an equally applied force of nine to sixteen pounds; this is best accomplished by orderly stepping the plugger from the centre of the filling to the cavity walls.

Packing done without order makes a filling weak and defective in spots, and develops many mercury pockets; packing done by an orderly applied force condenses each part of the filling equally, and the excess mercury is kept moving in one direction, outward, where it is at all times free to appear on the surface to be removed as it accumulates.

STEPPING THE CAVITY WALLS.

In packing the amalgam we find the round or slightly oval pluggers the most generally applicable. In packing against cavity walls with such pluggers we fail to compress small triangular areas between the steps; at such points excess mercury will be pocketed and imperfections will occur. Forcibly stepping the cavity walls with a plugger small enough to penetrate to the depth of these uncondensed areas is absolutely necessary to remove pocketed mercury, to correct minute defects and again wedge the amalgam into the tightest possible contact at this vulnerable point.

As the filling approaches completion and the cavity walls are covered, the mercury may be pinched out to the point where the mass still remains workable.

The cavity should be filled with an excess covering all margins, after which we condense thoroughly. A mallet may be used to advantage at this point for the final condensation.

If a quick-setting alloy has been used, we may proceed immediately to carve the occlusal surface with a discoid about 3 mm. in diameter, cutting lightly towards the cavity margins; the two to three minutes

taken for this work will permit the amalgam to harden sufficiently to permit the safe removal of the matrix by drawing it root-wise to the buccal or lingual. We now trim away the overlaps and burnish the amalgam lightly with a root canal plugger bent to reach all parts of the proximal surface; followed by lightly burnishing the occlusal surface, which completes the filling at one sitting.

After securing my matrix, where one is necessary, I always insert a tapered wood toothpick, generally from the lingual, to wedge the matrix into close contact with the gingival margin, by which means we help to enlarge and retain the interproximate space and avoid any overlap at this point.

PACKING PRESSURES.

One of the most difficult details of operative procedure to acquire is sufficient packing power in the pen grasp. I urge the necessity of practice to develop this packing power.

During the past few months I have been gathering from members of the profession a record of the pressure exerted in packing amalgam fillings, and, up to date, I find about forty per cent. of operators pack with a force averaging under seven pounds.

Nine to sixteen pounds orderly applied packing pressure is required to remove dependably the tin and excess mercury and secure adaptation.

Many failures will result with packing pressures of seven to nine pounds, and uniform failure will result when fillings are packed with less than seven pounds.

High-grade alloys packed with force under eight pounds make faulty adaptation, fillings so soft that the margins wear and develop the black ditch and retain excess mercury sufficient to cause excessive shrinkage. Slow developing defects apparent to the naked eye are almost entirely due to weak packing.

A tightly packed amalgam filling requires no grooves and undercuts to retain it; parallel walls and a square seat will retain the largest amalgam restoration when packed with nine to sixteen pounds.

THE PURPOSE OF TIN IN AMALGAM AND ITS ATTENDANT DANGERS.

My experimental and clinical test work leads me to the conclusion that tin alone is responsible for the flow observed in fillings made from high-grade alloys, and the remedy will be found in the use of an orderly packing of sufficient force to most completely express the unattached tin and excess mercury.

The more completely the finished filling is made up of the compound Ag_3Hg_4 , and possibly a similar compound of copper and mercury, the stronger and more stable the filling will be.

Tin in amalgam serves three purposes: First, it facilitates amalgamation; second, it lubricates the amalgam so that it moves on itself without drag when packing; third, it retards the setting sufficiently to provide

time for thorough manipulation. After these purposes have been served, the more completely we remove it, the stronger and more stable the filling will be.

Copper amalgam does not flow, probably because it contains no tin.

PULP PROTECTION.

Many more cases of pulpitis occur under amalgam fillings than with any other permanent filling material. First: Because amalgam is depended upon as a last resort; second, because we do not prepare the cavity with the same care as for gold, commonly leaving decay in close contact with the pulp; third, we have not considered or recognized the necessity for protecting the pulp from packing pressure developed when inserting the filling, and this pressure remains as an irritant to be subsequently aggravated into pain, by thermal changes that would have been tolerated, in the absence of the inflammation resulting from the pressure. Pulps protected from pressure will be found as tolerant to thermal changes under amalgam as under the cements.

SUMMARY OF GENERAL CONCLUSIONS

Proportions of alloy and mercury need not be exact, but mercury should always be in perceptible excess. A considerable excess of mercury will do no harm, but a slight insufficiency is dangerous.

The only dependable guide to insure a complete mix is accurate timing.

A complete mix insures adaptable plasticity, and is the first step to eliminate shrinkage and expansion in the finished filling.

By tamping we place and build amalgam into angles and against cavity walls without reducing its plasticity (compression destroys plasticity). While in this most adaptable state, we forcibly pack to remove the tin and excess mercury and to drive and wedge the amalgam into pressure contact with cavity walls, at which moment it immediately hardens and will stay put.

Orderly packing and stepping the cavity walls has proved the best procedure to insure equal condensation, the most complete removal of excess mercury, and the most effectual wedging technique to make airtight adaptation as the final detail of the packing technique.

Weak packing force will always make a soft, unstable filling, however good the alloy used.

A soft filling loses its margins by wear developing the black ditch, which by many has been considered due to spheroiding or to excessive shrinkage.

However good the alloy used, we must pack with an orderly applied force of nine to sixteen pounds to make a uniformly perfect filling.

The strength and stability of the finished filling is in proportion to the amount of tin and excess mercury expressed in the packing. The

more tin and mercury expressed, the stronger and more stable the filling.

The average sized mesio- or disto-occlusal cavity filled with a medium or slow-setting alloy will require as much of the operator's time as would be taken when restored with a gold inlay. If this be true, how can we justly charge a reduced fee for our amalgam service?

Average sized proximo-occlusal fillings can be inserted and finished at one sitting in fifteen to twenty-five minutes, when quick-setting alloys are used.

The same cavity filled with a medium or slow-setting alloy would require thirty to sixty minutes, with a second appointment necessary to make an equally good finish.

To justly reduce the fee for our professional services under these circumstances, we must learn to use successfully the quick-setting alloys.

Incomplete mixing and insufficient plasticity will make a leaking filling that may be strong in its resistance to crushing stress and flow when packed with force.

Weak packing makes a soft filling that will develop every fault characteristic of bad amalgam work.

A correct amalgam procedure that will assure a uniformly perfect filling is dependent upon the intelligent application of the following order of procedure:

Proper Cavity Preparation.—The use of a perceptible excess of mercury in the mixing. Thorough mixing for two to three minutes. A plasticity free from crepitus during orderly packing, for all except small and shallow cavities. Thorough, orderly and forcible packing. Stepping the cavity walls. Proper proximal and occlusal form and finish. A firmly held matrix wedged at the gingival, where the use of one is necessary. Protection of the pulp from packing pressure in all deep cavities.

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Relation of the Principles of Reconstruction to Periodontia, Considering Gingival Irritation

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WITHIN recent years, the study of periodontia has been seriously undertaken by a comparatively small group of dentists with a wonderful vision and an immense hope that, through united efforts, order might come out of chaos, and that prevention might supersede reconstruction. Perhaps in no period of dental history has there been better co-operation. We realize more and more that we are interdependent and that without a thorough knowledge of the principles of periodontia and a conception of its

etiological factors, it is an impossibility to build a reconstructive case that is truly restorative. "Restorative" is defined as an "agent capable of renewing health or strength." What better goal would an idealist want for a piece of reconstructive dentistry, whether it be an inlay, or a complicated piece of bridge work?

Traumatic occlusion is now generally recognized as an important factor in the etiology of the various forms of periodontal lesions. The present conception of periodontology has greatly added to our knowledge of these pathologic conditions and has established itself as one of the fundamentals of dental practice. According to the best authorities, the etiology of periclasia has been divided into two groups, primary or secondary, and that one of the principle factors of the primary is that of malocclusion.

It is a recognized fact that all cases of traumatic occlusion do not produce like lesions in all individuals. There are some whose tissues show advanced lesions at an early age, which result in congested gingivae, marked pericemental and alveolar disintegration; while the gingivae of others in late middle age are of good tonicity, with slight tissue wasting and whose alveolar process is practically in the same state as one may see in cases of natural atrophy, which is the concomitant of age.

The lack of applied dental anatomy is one of the many causes of gingival irritation, and when we consider that we have from forty to fifty inches of gum tissue around the necks of all of the teeth which we are accountable for, too much stress cannot be applied to occlusal anatomy, proper contact points, embrasures, solder points, interproximal spaces, and proper fittings around the necks of teeth. The success in reconstruction of the mouth first depends upon the healthiness of the underlying tissue and the absence of periodontal lesions which occur from the application of applied dental anatomy and also balanced occlusion.

Added to the above are three great evils causing gingival irritation. First, any metal which tends to go beneath the free margin of the gum, no matter how perfectly it fits the neck of the tooth. Second, exaggerated and too tight a contact point; and third, synthetic enamel fillings for gingival cavities and where they are intended to preserve contact of teeth. Can we imagine a greater introduction of traumatic occlusion where hundreds of inclined planes of all of the teeth are placed in disharmony than by exaggerated contact points and their loss by the latter two evils mentioned?

In a case of ulotrophia that shows progressive recession of the gingival tissue and exposure of cementum, malocclusion is more or less present, and where it has not hopelessly advanced, judicious grinding of the teeth to the best balance possible before any restorations are made is indicated and considered a sane procedure.

When the malocclusion is pronounced, such as is seen where there is a marked lingual inclination of the maxillary incisors or decided

abnormalities, the problem can best be solved by the co-operation of the orthodontist, periodontist, and the restorative operator.

I wish at this time to highly comment on the teachings and the fundamentals advocated by this section of our American Dental Association, for no man can be successful in restorative dentistry without a complete knowledge of periodontia, because the success and barometer of his work depends upon the absence of gingival irritation, periodontal lesions and healthiness of the underlying structures. In cases where it is necessary to restore the occlusal surfaces to obtain harmony and balance of the teeth, and where any lost member or members of the arch are to be replaced, the first essential is to make proper study models of the upper and lower arch in artificial stone or some hard material, mount them on an anatomical articulator which produces the movement of the mandible, and study these cusps and incline planes which interfere with harmony; and then with this chart proceed to the mouth, and with small stones judiciously grind those surfaces which interfere with the best balance and permit the greatest occlusal harmony before attempting any restorative procedures. For the above technique, permit me to refer you to Doctor Paul Stillman's article on "Traumatic Occlusion," in the November issue of *The American Dental Journal*. He has given to the restorative men, as well as the periodontists, one of the greatest and most important fundamentals, namely, the grinding of surfaces which interfere with occlusal harmony before treatment of periodontia as well as restorative dentistry. I wish at this time to express my appreciation to Doctors Stillman, Bricker, and others, for this fundamental which has proven a real value in large extensive cases, and has aided decisively as one of the factors in the elimination of gingival irritation. Here, too, I want to emphasize my association with Dr. J. Herbert Hood, a periodontist, who has given me much help and inspiration in working out these problems.

If the above procedure is not carried out before attempting a mouth restoration, we will introduce three great errors in all the dentistry placed in that mouth. First, if all the teeth to be restored to balance are out of occlusal harmony and are producing trauma, then, in that same proportion shall restorations and bridges continue to function in disharmony, with a result of perpetuating periodontal disease. Second, it will necessitate the lengthening of the crowns of the teeth to obtain occlusal balance to a point which increases lateral leverage and vertical stress most dangerous to the underlying structures as well as the teeth included in the restorations. Third, it adds to the adoption of exaggerated dental anatomy which invites gingival irritation and periodontal disease.

Following the first set of casts, a second is made after obtaining the best occlusal relation of the teeth possible by judiciously grinding the interfering occlusal surfaces, and these are mounted on an articulator for the study of those teeth to be restored to balance necessary for

maintenance of health and function. At this point the diagnosis and prognosis for restorative procedure is of vital importance to periodontists as well as the crown and bridge worker. We find the profession divided into two schools. On the one hand, we have men who proclaim the accurate reproduction of the temporo-mandibular movements as being essential to successful construction; and, on the other hand, we have those men who pay no attention whatever to the temporo-mandibular articulation, at least no attention within reasonable limits, but rather uphold the occlusion as the master of the situation. In regard to the latter or spherical principle, let us clearly keep in mind one definite fact in reference to restorations of all types, as well as its diagnostic value in periodontia. This principle claims a spherical arrangement for teeth in skulls of the white race of the highest type of development. Both race and high type of development are two mooted questions in anthropology. Having no pure-bred race, it is almost equally safe to say that there does not exist in our daily life, an example of the highest type of development. The original races of men have become blended by inter-breeding, until it is well nigh impossible to draw fine lines of distinction; and, as for the highest type of development, we have external influences that tend to affect what might have been originally predestined to be a high type of development. Briefly stated, function influences form and use, both normal and abnormal, including overuse and lack of use, whether symmetrical or asymmetrical, and has its resultant changes in form. Therefore, if we are presented with a case where only a few teeth have been lost, and it is diagnosed to restore those lost members by means of bridge work, we cannot very well take for granted that prior to the loss of those teeth this particular individual's skull was of the highest type of development and uninfluenced by such external forces as excessive use of one side over the other. Therefore, the restoration of a mouth of this type to the spherical tooth arrangement would be a great error and the desired prognosis would be defeated. When casts are made for the detection of traumatic occlusion or cusp interference, and also for the restorative measures, the spherical instrument can only be used upon those cases that were at one time, or would be at the present time, in spherical arrangement, had it not been for the one and sole disturbing factor that produced the cusp interference. On the other hand, if the patient belongs to a type in which the plane of occlusion and curve of spee under normal conditions were straight or almost flat, coupled with normal mesio-distal relationship, and this individual developed cusp interference resulting in periodontal disease, it would be a great error to bring these teeth to the spherical principle for occlusion. It has been the writer's observation that those cases in which the plane of occlusion is other than spherical, and the spherical arrangement was applied, that the introduction of traumatic occlusion, gingival irritation and lack of function was increased rather than diminished. Also, that to obtain proper mesio-distal relationship in

these certain cases, a locked occlusion resulted, and this is one factor to avoid in the remedy of periodontal injury.

Let us now consider a very important factor applied only to cases of balanced occlusion, where opening of the bite is to be considered for occlusal harmony. After five years of intensive study and research, the Prosthesis Society recognized the vast importance of centric occlusion in denture prosthesis and the registration of the same by the Gysi Gothic Arch. Doctor Hight, of Houston, Texas, demonstrated its great importance at the Louisville meeting, and, in accordance with this principle, I wish to state its importance and use in any of the so-called open bite cases. The main reason for its application in restorative work is the exact occlusal harmony obtained from centric occlusion and the absence of vertical as well as lateral stress.

Let us suppose that centric occlusion, normal to the individual, is varied a fraction of a millimetre and the entire restoration built to this error, all of the incline planes would be placed in disharmony, trauma would be introduced, with the ultimate result of disease of the hard and soft tissues.

If we accept centric occlusion properly obtained by the Gysi Gothic Arch and modified by Doctor Hight, and not rely upon any articulator, by merely placing a thickness of material between the teeth, we shall have the right starting-point to begin any restorative procedure in open bite cases. We must receive centric occlusion from the individual with the Gothic Arch tracing and then transfer this record by means of the Snow face-bow to an instrument which will indicate as near as possible the harmony between condyle paths, curve of spee, normal to that particular case for which the restorations are to be made. When the teeth in the mandible are once separated from those in the maxillae, or the bite is to be opened, all accurate occlusal relationship is lost; this fundamental applying to crown and bridge open bite cases, as well as those where all the teeth are lost and are to be built up to proper balance and occlusal harmony. The occlusal relationship can only be brought back to proper harmony by the Gothic Arch tracing, as advocated by the best men in denture prosthesis, which applies equally as well for open bite restorations.

These principles are very important to the periodontist for the diagnosis and prognosis of his case, as well as the men who attempt restorative measures, as he builds dentistry with the greatest occlusal harmony in mind to maintain health of all periodontal tissue. Any tooth whose cusps are out of harmony produces abnormal stress during occlusal function, and this stress also produces abnormal pressure against the pericementum with alveolar bone absorption and resultant periodontal disease.

In conclusion, the writer wishes to summarize the following thoughts, that a thorough knowledge of the etiology of periclasia and periodontal disease must be fully understood by men who attempt restorative

dentistry, and that success in the future of that case shall be in direct proportion to the healthiness of all underlying structures. On the other hand, the periodontist must recognize and demand, in these cases where occlusal restorations are necessary, the adoption of occlusal harmony between condyle paths, curve of spee, and muscles of mastication, normal to the individual at hand for proper function and lack of gingival irritation and disease. That the dentistry placed in that mouth should be adapted to the individual and not to some ideal in mind. Also, that the failure of certain cases in the hands of a few periodontists will be directly due to the fact that they did not demand that proper dental anatomy and occlusal harmony, as well as balance, be properly accomplished, or had refused to accept these patients referred to them by other members of the profession.

The application and knowledge of applied dental anatomy cannot be too heavily stressed as one of the many causes of gingival irritation, and not be carried to extreme. For example, the placing of occlusal anatomy of a twenty-year-old individual in the mouth of a fifty-year-old patient. Coupled with this thought, let us construct the dental anatomy of teeth to be restored with the greatest possible harmony with condyle paths, muscles of mastication, and curve of spee, and not to some ideal.

In those cases where we are called upon to open the bite, and where we lose all occlusal relationship between the teeth of the mandible and maxillae, the adoption of the registration of centric or central occlusion by the Gothic Arch is as important as the same registration of centric occlusion for full denture cases. The elimination of traumatic occlusion in such a full mouth restoration, starting from a central point, normal to the individual, will give the greatest occlusal harmony to all incline planes and the prognosis is favourable relative to gingival irritation and periodontal disease.

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The Prevention of Pyorrhea*

JOHN OPPIE MCCALL, D.D.S., F.A.C.D., F.A.A.P.



RIENDS of the Radio Audience: The title of this talk is "The Prevention of Pyorrhea." Prevention of any disease is usually accomplished, or at least intended to be accomplished, by measures which can be applied by each one in his own home. Unfortunately, pyorrhea cannot be prevented by home care alone. Many of us must enter into a sort of partnership of effort with the dentist, if we are actually to prevent this dread disease. Many of us, however, can prevent it almost entirely by our own efforts. And even those who must seek the assistance of the dentist, will find that

*Radio talk during meeting of the Montreal Fall Clinic.

much of the work of prevention is still to be carried on by the labour of their own hands.

And it is of this home care that I wish to speak to you. Another New York dentist, Dr. Paul R. Stillman, has given to this home care of the mouth the striking name of "Physical Culture of the Gums."

Physical culture is a phrase whose meaning is understood by everyone. So common is its use in magazine articles, newspapers, etc., that it is entirely unnecessary to define it. It is also unnecessary to recount the benefits to be derived from physical culture. What I want to say to you is that physical culture is not confined to exercises designed for the strengthening of various muscles, although that is what we commonly think of in connection with this term. The real benefits of physical culture are manifested in the health of the body as a whole; and the reason is, that the exercise of the muscles stimulates the flow of blood throughout all the blood vessels of the body. This is the foundation of health—a vigorous circulation of blood. Now this vigorous circulation of blood does not depend on the rapidity and strength of the heart beat alone, but on the condition, or tone, as we call it, of the blood-vessels themselves. In other words, when we bring an influence to bear, which improves the tone of the blood-vessels, we are taking a very important step toward health.

It is to this aspect of physical culture that I wish to draw your attention, for there are no muscles attached directly to the teeth and gums. Yet, we can apply the principles of physical culture to these structures and can influence their health as markedly by physical culture, as though they were highly developed muscular tissues. We do this by influencing the circulation, and it is the method of *accomplishing* this that I want to describe to you.

Before telling you how physical culture methods may be applied to the mouth and teeth, it may be interesting to tell you something about that growing scourge of our day—pyorrhea alveolaris. This is a disease which attacks the gums and bone which surround the teeth. The end result of this disease is loss of the teeth, and the intermediate result is all too often the loss of the individual's health. Nearly everyone who talks to a dentist about pyorrhea wants to know, first, if they *have* it; second, what *causes* it; and third, *can it be cured?* The first question is the most difficult one to answer through the medium of the radio. The advanced stages may be detected by the looseness of the teeth and the exudation of pus which can be squeezed out at the edge of the gum. Earlier stages cannot be described in such simple terms.

The second question, as to the cause of pyorrhea, can be answered in fairly simple terms. Every human being has bacteria in his mouth all the time. A large proportion of these are bacteria which are capable of causing disease. The reason that we get disease is not, however, because of the presence of bacteria, but because the natural and inherent resistance of the gums has been vitiated. In studying

pyorrhea, then, we should be primarily interested in the things which destroy or diminish resistance. By that same token, a most important part of our curative treatment is directed toward the building up of resistance.

The best way that I know to destroy resistance, is to provide a persistent irritation to the gums, or to the boney support of the teeth. We provide this irritation when we allow tartar or other deposits to accumulate around the necks of the teeth. A more insidious and a more damaging irritation is produced when the teeth are irregularly placed in the jaw. This irregularity, which may not even be so pronounced as to offend the eye, is responsible for an uneven distribution of pressure when the teeth of the two jaws are closed against each other. When this occurs, certain teeth are over-strained, and this excessive strain, which is repeated hundreds of times a day, causes irritation of the bone and membrane around the teeth.

Irritation, no matter how produced, brings about a derangement of the blood supply, which usually results in congestion. It is at this point, when congestion has become established, that infection of the gums takes place. When the gums have once become infected, they do not throw off that burden until the blood supply has been brought back to normal.

It will probably be obvious, from the trend of these remarks, that I am of the opinion that pyorrhea can be cured; and I will so answer the third question, which I propounded a few minutes ago. As in all fields of medicine, the measures which are effective in cure may be applied, in principle at least, to prevention. Since the cure of pyorrhea cannot be accomplished through the application of advice given over the radio, I will confine my attention to the subject of prevention.

Remember, please, that resistance to infection is largely dependent on normal blood supply. Then, keep in mind also, that the blood supply can be deranged by anything that causes sustained irritation. Then remember that the only effective way to get rid of infection is by improving the blood supply. Irritation which has become established as a constant factor, can only be relieved by operations performed by the dentist, and I will, therefore, pass over that phase of our subject. We can, as individuals however, prevent the establishment of much of the irritation to which the gums are subject, by two measures of which I am now going to speak. Both of these may be properly included under the heading of "Physical Culture for the Teeth."

The first is the natural exercise of the teeth in their function of mastication. Vigorous use of the teeth, beginning in childhood, is Nature's best preventive. It accomplishes two things: First, it promotes a vigorous circulation of the blood, as all exercise does. Second, it wears down the high spots on teeth which are irregularly placed. Through wear, there is accomplished a balancing of the stresses or pressure of the teeth against each other, so that excessive strain is

relieved. As soon as this equalization of force has been accomplished through natural wear, the vigorous use of the teeth will stimulate the blood supply and this will result in the building up of stronger and more resistant gums and bone around the teeth.

The second measure for the institution of physical culture for the teeth is a more artificial one. The need for it is to be found in the failure of the dietary of modern civilization to provide the high degree of exercise and function necessary to build up the highest tissue of resistance. To supplement this shortcoming, we resort to an artificial means of stimulating the blood supply. This is done through the use of the toothbrush.

It is a strange commentary on the accomplishments of science that only after more than a hundred years of use have we discovered a truly successful method of using the tooth brush for the promotion of health in the mouth. In the early years of its existence, the tooth brush was used for cosmetic effects alone. It accomplished this object with varying degrees of success. But, as time went on, dentists observed what they believed to be a harmful effect produced by the tooth brush. To the brush they ascribed the responsibility for recession of the gums and even inflammation and pus formation in the gums. Even now, some dentists prohibit the use of the tooth brush in their patients' mouths. They have recognized its cosmetic value but have condemned it because they failed to realize that it might be made to produce a beneficial, rather than harmful, effect on the gums. Within the past few years we have come to see that by recasting the emphasis on the functions of the tooth brush, and by utilizing it as an instrument for stimulation rather than for the promotion of beauty alone, we may make of it an agency for health without losing its value in preserving the appearance of the teeth.

Through the use of the tooth brush, with this dual role as its inspiration, we have learned a new application of an old truth. Beauty and health are synonyms, and whatever promotes health in the highest degree will also promote beauty. We therefore find in the correct use of the tooth brush a means not only of securing health, but by that very act a means of enhancing the beauty of the teeth and gums. Along with the realization of these facts has come the further discovery that the healthy mouth is naturally clean, and that uncleanness in the mouth is a symptom of disease. To keep the mouth healthy, therefore, is the best means of keeping it clean.

For the accomplishment of these results, the tooth brush requires but little modification. It should be smaller than the average brush on sale to-day, and it should have bristles all of one length. The bristles should be fairly stiff, but they should have pliability. They should be about three-eighths of an inch in length. Any brush which answers to these specifications will be acceptable for the method of use which I shall describe.

The first thing which we require is to get a mental conception of the effect we desire to produce with the brush. Remember that its province is the stimulation of the blood-supply, not scrubbing to produce cleanliness alone. Cleanliness will come when health is acquired, and with health will come beauty. The bristle-ends must be so applied that they will not stab or pierce the gum tissue. Nor should the brush cause friction. Such effects are produced when the brush is used like a scrubbing brush, with the bristles pointing directly toward the gum. On the other hand, pressure, especially intermittent pressure, is essential for the stimulation of blood-supply. To accomplish this result without piercing or otherwise irritating the gums, it is necessary to apply the tooth brush more in the manner of a paint brush than a scrubbing brush, with the bristles pointing toward the gum. This slanting application of the bristles at once removes the tendency to cause irritation. Having accomplished this, it is a simple matter to produce the desired pressure on the underlying vessels by causing the bristles to bend slightly. The visible effect of the correct application of pressure is a blanching of the gum in the vicinity of the brush. Having produced this blanching, the handle of the brush is given a slight back and forth movement, which does not, however, cause the bristle ends to leave the spot where they were first applied. As they bend, and with the influence of this slight back and forth movement, the tendency is for the brush to pass toward the cutting edge of the tooth. This provides for the cleansing of the tooth surface and also insures the gum against any injury through a wrong direction of pressure.

The object of producing the blanching is to drive the blood out of the vessels, especially the veins near the gum margin. When the bristles are bent by the back and forth movement of the handle, there occurs a pumping effect on the blood contained in the vessels, and a quickening of the circulation is induced following the primary drainage which was indicated by the first blanching. When the brush has passed over the tooth surface to the cutting edge, it is again placed at the gum margin and the procedure just described is repeated. It is this repeated application of the brush, with a bending pressure on the bristles, which provides the effect to which the name "Physical Culture" has been applied. The repetition of this act is quite as necessary to produce the desired stimulation as is the repetition of exercises performed in a gymnasium. The analogy may not be obvious, but it is a fact that effects produced by this form of artificial exercise are essentially the same as that produced by normal mastication of food. It is important that this analogy be kept in mind.

The important things to keep in mind are: first, the position of the bristles, which must be started at an angle of about 45° to the tooth and gum surface; second, the bristles point toward the gum, that is. up on the upper jaw and down on the lower; third, the brush is applied where the gum meets the tooth; fourth, the brush is given a slight back

and forth movement which carries the bristles in between the teeth, but does not force them up into the gum; fifth, this slight back and forth movement, if properly done, will result in the brush passing over the tooth surface toward the cutting edge—it is then replaced at the gum line and the movement repeated at least ten times in each location.

In conclusion, let me summarize briefly the results which can be attained by this method of caring for the teeth and gums. Gums which are spongy and bleed easily soon become pink and firm. The loose teeth in many instances become firm. The complexion of the teeth themselves is changed. Teeth which once were dull and muddy in appearance become translucent and pearly through the effect of the improvement in circulation which extends even to the interior of the tooth.

No one can take exercise for another, and equally so, no one can have health produced entirely through the efforts of another. The health of each person's mouth depends upon his own care. It is a personal responsibility.

* * *

Health and Education*

WILLIS A. SUTTON,

Superintendent of Schools, Atlanta, Ga.



THE relationship of mouth hygiene and good teeth to the health, scholarship and promotion through the grades of the public schools has been made the subject of careful study by the public schools of the city of Atlanta, Ga. In a school of 987 students a careful study was made. The records of the preceding year were compiled. These children lost, on account of bad teeth and other physical defects, 5,561 days from school. Twenty eight per cent failed in two or more subjects, 83% of them were under weight and their physical condition was deplorable.

A dentist was employed and each child's mouth was put in good condition. Six weeks after each child's teeth were finished we commenced to keep his record and continued to keep it for an additional period of nine months. We found that we saved 3,301 school days. We discovered on comparison of the records that the failures had been reduced from 28% to less than 8%, thus saving at least one-half of a year for 200 children. Instead of 83% being underweight, only 29% were underweight, and the appearance of the children had undergone so remarkable a change that many who had seen them before we commenced the experiment could scarcely recognize them.

The work had been accomplished at a cost of less than four thousand dollars. The savings were as follows:

*Radio talk at a public meeting held during Montreal Fall Clinic, in Mount Royal Hotel. Chairman Sir Arthur Currie, Principal of McGill University.

3,301 school days at ten dollars per day=	\$ 33,010.00
½ yr. in life of 200 children at \$500 per half year=	100,000.00
Total	\$133,010.00

This, of course, does not include the efficiency and happiness of the whole 987 children. The years added to life are an additional profit that cannot be estimated. The improvement in cleanliness, conduct and morals was apparent to all.

Not content, I asked for an additional experiment. In a school where fifteen teachers were working, I asked each teacher to give me the name of the child who was hopelessly backward and who had, in the opinion of the teachers, no hope of passing his or her work. Without revealing our purpose to the teacher, we sent these children to physicians and dentists. We removed their physical defects as far as possible. We treated their teeth, filled the cavities and caused their mouths to be put in good condition. The results, at the end of the year, showed fourteen of the children promoted in every subject. Our conclusions from these experiments were as follows:

1. There is a direct relationship between the condition of a child's teeth and his general health.
2. If a child's teeth are in good condition he saves many school days, is more regular in attendance.
3. The child with a clean, well-kept mouth increases his chances of success in school 25%. If this is true in school, why not in life?
4. It is the practice of economy for school boards to see that children's teeth are inspected and cared for.
5. Better conduct and morals result from good teeth.

The experiment having been made, and conclusions determined, we proceeded to put a plan into operation that would give over 50,000 children the benefit of our findings. We realized that the present tax rate would not permit us to employ enough dentists and physicians to correct all defects. We did not believe that all children's teeth should be fixed at public expense. We realized, nevertheless, that all should be inspected and those found defective must be remedied. The city employed two dentists who made careful inspection. We made it the duty of the teachers and nurses to follow up the inspection and get the children to the dentist. We secured the promise of the dentist to co-operate and treat the children's teeth at a reasonable price. The records of the examination were kept in triplicate, one going to Health Dept., one to teacher, and one to the home, with a note urging the necessity of action, and telling the benefits to accrue to the child.

Parent-Teacher or Mothers' Club committees were formed to assist. People whose financial condition would prohibit the expense were certified to teachers, and school authorities, and these were treated free of cost at the various clinics. Physicians and dentists were invited to speak

to the Mothers' meetings, and information as to care of teeth was disseminated by nurses and dentists.

As superintendant I made an investigation and found that children were losing three days per term on account of poor teeth. I felt justified in offering each class, where every child and teacher secured a dental certificate, a holiday. This was very effective. We made a campaign for 100% teeth in every room. We commenced this work five years ago; the first year we had two schools where every child had a dental certificate. Many other schools went as high as 80%. In the following year we observed that the number of children in these 100% schools taking measles, mumps, etc., was relatively small, attendance in these schools was high. Promotion rates were correspondingly high. The second year there were nine schools 100% in teeth, and results continued to be most gratifying. Last year 42 schools out of fifty came to the 100% mark, and the improvement in our entire school system has been phenomenal.

First—we have passed from an attendance of 84% to an average attendance of 95.6%.

Our failures have been reduced from an average of 20% to less than 8%.

The health and conduct of our children is the subject of comment by all who know them.

Mouth hygiene is taught consistently in all schools and is practised by our children.

School Boards, school administrators, teachers and parents must realize their responsibility for an oral hygiene programme. The health of our people is paramount to all other issues. We must meet the responsibility.

* * *

The Preparation of a Vital Tooth for a Porcelain Jacket Crown*

H. SPALDING BOTH, D.D.S., NEW YORK, CITY.



THE use of porcelain jacket crowns for the restoration of teeth is by no means new. The method has been subjected to the severest of all tests, experience, and the results have won for it an established place in the procedure of many exacting operators.

The test of time and experience have shown that the method possesses outstanding advantages of the kind that appeal to progressive operators, and that make the mastery of its technique distinctly worth while. The method has been in use for a sufficiently long time to allow observation of results in specific cases over a period of years. These observations

*Clinic by aid of Motion Picture.

testify to the durability and permanence of the porcelain jacket crowns, when administered at the proper time, and with due regard to the details of correct manipulation.

Furthermore, the method has been applied to a wide variety of situations and to meet different conditions. Here again the results have evidenced its unusual value in regard to adaptability. When with these assets are coupled the additional qualities—comparative simplicity of technique and esthetic superiority over other methods—it is plain that porcelain jacket crowns meet every requirement demanded of scientific dentistry, from the viewpoint of both the patient and the operator.

In the light of these facts, I feel not only that the method may be safely recommended, but that encouragement of its more general application among the members of our profession is an obligation. My purpose in presenting this film is to accomplish just that. In attempting to do so, I believe it is more effective to point out the relative simplicity of the operative procedure than to dwell upon the obvious advantages of the results. For, leaving these aside, the fact remains that it is far easier to make a jacket than a well-fitting, complicated porcelain inlay.

In making out a strong case for the use of porcelain jacket crowns, however, a conservative word of caution should be included. Enthusiasm should not prompt the operator to resort to the method without due consideration of the pros and cons. The best success depends upon discriminating use. With all the factors in its favour, there are definite limits to the problems that can be properly solved by even so versatile a method.

The indications for resorting to this form of restoration are usually so clear as to make detailed discussion of the point unnecessary. Among the classes of teeth for which the jacket crown is particularly adapted may be mentioned the following:

1. Anterior teeth destroyed by caries, especially when these carious areas involve one or both approximating sides and when the incisal edge is involved.
2. Discoloured teeth.
3. Teeth broken off by accident.
4. Teeth with unsightly or imperfect fillings.
5. Teeth in faulty alignment or occlusion.
6. Teeth where a filling would be of questionable duration.

These are the most common types encountered. Others might be included. Bicuspid and molars are suitable for this treatment where a cast gold inlay might be objectionable. Devitalized molars offer ideal subjects but, inasmuch as the film is to deal with vital teeth only, the technique for the former type of tooth will not be described.

The use of porcelain jacket crowns for the restoration of teeth is by no means new. Their advisability is so apparent that any lengthy discussion of these points would be superfluous. They have conclusively

proven their absolute dependability through years of use. The indications for resorting to this form of restoration are usually so clear as to deserve only passing comment. Among the class of teeth for which the jacket crown is particularly adapted, may be mentioned the anterior teeth destroyed by caries, especially when these carious areas involve one or both approximating sides, and when the incisal edge is involved; also discoloured teeth, teeth broken off by accident, teeth with unsightly or imperfect fillings, teeth in faulty alignment or occlusion, or where a filling might be of questionable duration. These are the most common types encountered, but others might be included. Bicuspid and molars also adapt themselves to this form of restoration, when a cast gold inlay might be objectionable. Devitalized molars are ideal for this form of restoration, but as this paper deals with vital teeth only, the technique for this type of tooth will be omitted.

Porcelain jackets meet every requirement that scientific dentistry can demand. In addition they possess esthetic superiority. Considering all the advantages, it is difficult to understand why this mode of restoration is not more widely used.

My purpose in writing this paper is to encourage its more general application among the rank and file of our profession, and to point out the comparative simplicity of the operative procedure. When the dentist realizes the possibilities of the porcelain jacket, he uses it very frequently with most gratifying results. It is unquestionably true that it is far easier to make a jacket than a well-fitting complicated porcelain inlay. One should not allow his enthusiasm to run rampant, however, and to use jackets indiscriminately and in places for which they were never intended.

PREPARATION.

Many methods, varying in detail, may be suggested and used, with equally good results. The method here described has proven its worth in the hands of a large number of operators.

The technique is as follows:—A roentgenogram of the tooth is obtained to determine the size and shape of the pulp, especially of that part situated in the coronal portion. It also shows any abnormalities of the pulp chamber, such as the cornus and whether or not pathological conditions exist in and around the environments of the tooth. A pulp test may also be made.

An impression is taken of the tooth with a stick of Kerr's Modelling Compound. This is forced well around all of the surfaces of the adjacent teeth and a model is poured for study purposes and for future reference in working out the detailed characteristics of the tooth.

Before starting the actual tooth preparation, it is essential to keep the picture of what is to be finally accomplished vividly in the mind's eye. The prepared tooth stump should be in miniature a replica of the

original tooth. This must be continuously kept in mind. If the proper procedure is followed, many vital teeth can be prepared without the use of conductive or infiltration anæsthesia. I always attempt to prepare a tooth this way.

With No. 3 VulCarbo disk $\frac{7}{8}$ inches in diameter, the mesial and distal enamel is quickly removed, running the disk at high speed and with little pressure under a continuous stream of warm water. The triangular pieces of enamel so cut are then readily broken or chipped off at the cervix with a suitable chisel, such as No. 84 S. S. White or 85. When this is accomplished, the sides of the tooth should be parallel, converging but slightly towards the incisal.

The tooth is now shortened about one quarter with an S. S. White mounted stone No. 11, the stone being kept wet, without pressure and at high speed, and following the general direction of the original incisal edge, but planing the surface to best withstand the stress of incision.

The next step is to remove all the enamel from the tooth. This is essential, as will be seen later. Many ways for accomplishing this have been devised, and most dentists find the use of enamel cleavers the most satisfactory. Before the cleavers are used, however, the enamel is cut into little diamonds with a small knife edge stone, such as a Miller No. 232, $232\frac{1}{4}$, $232\frac{1}{2}$, or an S. S. White No. 10. The stone cuts through the enamel at the neck of the tooth and following the cervical margin on both the labial and palatal surfaces, the approximating surfaces having already been cut. Great care must be taken not to cut into the dentine. Little diamonds are then made all over the labial and palatal surfaces as the cuts are made first in a mesio-distal and then an inciso-gingival direction. On the palatal side, the cuts are usually made more oblique. The enamel so cut readily yields to Dr. Le Gro's enamel cleavers and is rapidly denuded from the tooth. Care must be taken not to remove any of the dentine, for as you all know, the more tooth that remains after allowing for the thickness of the porcelain, the more protection is given the pulp and the more nearly is the natural condition approached. The importance of sacrificing as little tooth structure as possible cannot be over-emphasized.

With sub-gingival enamel cleavers the enamel under this delicate tissue is very carefully removed. At this time, and at this time only, is the copper band fitted. The Blue Island Specialty Company makes a very handy selection of seamless copper bands or tubes in 20 different diameters, $\frac{1}{2}$ inch long and 36 gauge. These are neither too stiff nor too soft, and answer the purpose very well. The proper diameter, one which fits fairly snugly, is selected, trimmed and festooned to follow the gingival margin, much in the manner of the gold shell crown. The trimmed edge is smoothed off with a fine stone to avoid laceration of the gingiva. Only one band need be fitted. This is now laid aside.

The making of the shoulder is the next step. If all the enamel has

been removed from the tooth,—and I cannot stress this point too strongly,—the cutting of the shoulder in the softer dentine becomes very simple. It is just as important to know what to avoid, as to know what to do. The shoulder should not be too broad. If it is, it will be necessary to sacrifice a lot of dentine from the remaining sides of the tooth. Depending on the diameter of the tooth, choose No. 56 or 57 fissure burr and begin cutting the shoulder at one definite point, usually at the disto-labial part in a left upper and at the mesio-labial part in a right upper incisor. The handpiece is held firmly with the four fingers and palm, with the thumb resting securely on the incisal or occlusal surface of a convenient adjoining tooth. Great care should be taken not to lacerate the delicate gingival mucosa or peridental membrane with the burr. This can be avoided by starting to make the shoulder at the free margin of the gum and not under it. With a lateral sweeping motion, by gradually cutting in an apical direction with the aid of the burr and in a pulpal direction with the side of the burr, exerting little pressure on the instrument and avoiding the creation of thermal shock, the work is soon accomplished. The engine handpiece should always be held with the fissure burr at right angles to the floor of the seat and not parallel with the long axis of the tooth. This assures a continuous smooth shoulder without pits or steps. The burr should not be held in one spot, but swept gradually over the labial and palatal surfaces. The breadth of the shoulder should never be as great as the diameter of the size of the tooth to be worked upon. For instance, in lower anteriors, the shoulder is a mere suggestion and is much narrower than in an upper central or cuspid. The narrower the shoulder, with the strength still maintained, the less dentine will obviously need to be removed from the remainder of the crown and the more ideal will be the operation.

The shoulder has now been cut in one continuous line about one millimetre below the free margin of the gum and all around the tooth. After it is certain that the seat is completed in one definite continuous line, the shoulder is trimmed up with a narrow chisel such as No. 27 of Dr. Black's set, or files of convenient size of Dr. Bastian's set, so that the floor is perfectly smoothed and at a sharp right angle to the conical stump now remaining and flaring slightly outward toward the periphery.

All cavities and undercuts are now eliminated and the tooth is polished with cuttlefish disks. Then it is dried, painted with phenol followed by alcohol, and painted with a cavity lining such as resin and chloroform, using the hot air syringe for this purpose.

The importance of sealing the dentinal tubuli before submitting the dentine to the tremendous pressure of the modelling compound is apparent. We all know how drugs, dyes, etc., can be forced through dentine under pressure, and we should, therefore, not force the bacteria-laden saliva into a healthy dentine. Therefore this should be done before the actual impression is taken.

TAKING THE IMPRESSION OF THE TOOTH.

The previously fitted copper band is now replaced on the prepared tooth. As the palatal side of our original tooth is quite differently shaped from the labial, so should the preparation differ. It is not necessary, therefore, to mark the labial side of the copper band. The two surfaces will look so entirely different that no error can occur in the subsequent amalgam die.

The band is now accurately placed on the tooth, reaching slightly beyond the shoulder. It is held in position with the thumb and index finger of the left hand, while a small or medium sized Kerr's modelling compound cone is warmed over a small Bunsen flame with the right hand. These cones come in three different sizes. The size best adapted for the size of the band should be selected, and heated so that the tip is soft and the consistency of the modelling compound is more and more cool and unyielding toward the base of the cone. The fingers of the right hand are vaselined slightly to keep the mass from adhering to the fingers.

The copper band is placed on the tooth first without the modelling compound, because if the band is forced on the tooth with the compound in it, it might not pass at some point on the shoulder, and will produce a faulty and incomplete impression of the shoulder and no impression at all of the root just slightly beyond the shoulder.

Having placed the empty, but fitted, copper band in its correct position on the tooth, the tip of the correctly heated modelling compound cone is dipped into vaseline and is then inserted into the copper band, the hard unyielding base on the cone acting as a piston to force the softened modelling compound well around and beyond the shoulder of the prepared tooth. To further facilitate the impression taking, hot air may be played all around the cervical margin of the copper band while apical pressure is exerted upon the copper band and its contents.

The impression is now chilled with cold water or cold air, and carefully removed from the tooth with the aid of a small napkin in a direction with the long axis and general direction of the tooth. The impression is dried out and inspected to see whether a perfect impression, including the entire shoulder, has been obtained.

The bite is now taken by burnishing some tin foil over the opposing teeth and covering this with a strip of the softened base-plate wax. A small piece of base-plate wax about one inch square is softened and shaped into a cone. It is forced upon the prepared tooth and well adapted to it, and over this, and the surrounding teeth, is placed a soft strip of base-plate wax. The patient is now asked to close the mouth in normal occlusion, and, while the mouth is closed to force the wax against the palatal and lingual aspect of the teeth with the tongue, while the operator burnishes the labial aspect of the wax with his

fingers. After this is chilled and removed from the mouth, the bite wax is dried and reinforced with sticky wax.

The taking of the impression can be done many ways. Some operators prefer to take a second ferrule impression of the tooth in modelling compound, and while this remains in position to take a plaster impression. Others take plain modelling compound or plaster impressions without the copper band impression. I prefer to take an impression in base-plate wax. The degree of accuracy of the impression with this material depends considerably upon the manner in which it is heated. The bulk of the wax should be fairly hard. It is placed in a suitable impression tray, the surface well heated over a Bunsen flame and placed in the mouth, always being sure to include the corresponding tooth on the opposite side in the impression. I prefer the wax impression because the amalgam die will fit into it with the least possibility of being wrongly placed either mesio-distally or bucco-palatally, or inciso-gingivally.

The plaster impression over the ferrule modelling compound impression is undoubtedly very accurate, but I have often experienced difficulty in placing the amalgam die poured in one impression accurately into a second impression. Using the same ferrule impressions for the die as well as for the plaster impression is more desirable, but this deprives the operator of examining the modelling compound impression until after the plaster impression is completed.

TAKING THE SHADE.

Volumes have and could still be written about taking the shade. The ceramic worker should always strive to imitate the general and specific characteristics of the tooth. This phase of the work is at least as important as the correct colour. The degree of convexity of the labial surface, the mesial and the distal outline, the size of the interproximal space, the peculiarities in the formation of developmental grooves at the cervix, stains and the formation of discoloured secondary dentine at the incisal edge, such as is found in elderly people, whose teeth are worn by attrition, the rotated effect of laterals and many other details should be worked out to give the maximum result in esthetics. I have made hundreds of shades with various combinations of porcelain. I have baked central facings to match the different standard shade guides. The purchasing of large quantities of porcelain of a certain shade at one time eliminates any variation in this particular colour. This part of the subject takes us too far into the subject of the baking of the crown and does not, therefore, come properly under this heading.

Take the shade with the guide which is most familiar, and with which you can reproduce the colour with the porcelain being used. Some men use the shade guides supplied by the manufacturers of the porcelain. When this is done, the tooth must be divided into sections, matching each section with the particular colour best adapted.

PROTECTING THE TOOTH DURING THE INTERVAL OF MANUFACTURE.

Here again many different methods with varying degree of satisfaction have been devised. For vital teeth, I invariably use base-plate gutta percha rolled up in a cone and adapted to the tooth, trimming it with hot instruments to resemble the original tooth. The gutta percha is carefully trimmed at the cervical margin so as not to go beyond the shoulder. After this is chilled it is removed, trimmed and polished and cemented on the tooth. This covering affords a very comfortable protection for the tooth.

OPERATIVE AND MECHANICAL TECHNIQUE INTERLOCK.

The operative part of the procedure so interlocks with the prosthetic that it is obvious to all ceramic workers that the best results are obtained when the operative part and the technical part are done in close co-operation with each other. A crown baked in an outside laboratory, even if the most skilful and conscientious, cannot give the best results. Every dentist can make a better crown himself, after a little practice.

The crown should be fitted in the mouth just prior to putting on the final bake, and before the platinum hood or matrix is removed from it. At this time a careful examination of the cervical fit, the contact point, occlusion, etc., is made. The matrix is now removed and the crown washed and dried with alcohol. The tooth is made ready for the reception of the jacket by drying with alcohol and again painting with resin and chloroform. The jacket is lined with a creamy mixture of cement and gently forced upon the tooth.

The colour of the cement is a very important problem. Many beautiful jackets have altered their shade by the colour of the cement. This is particularly true if the labial part of the crown is thin and, therefore, very translucent. The salient point to remember is that a light coloured cement seems to have the least effect on the jacket and, therefore, cream-white or cream cement is most commendable. The cement may first be mixed with water for a try-in, if the operator wishes to assure himself of the result. Should it be desirable to darken the colour of the jacket, a darker cement should naturally be chosen. After the cement has set the surplus is chipped away and the cervical joint polished with strips.

CONCLUSION.

In this paper I have merely tried to give a brief resume of the operation. Many deviations which are naturally developed during long practice are omitted, for the operative procedure is usually altered to the individual's need and adaptability. It is difficult to picture a technique vividly with words only and pictures. Illustrations, diagrams, etc., often tell the story much more impressively and accurately. The

actual preparation of a vital upper central incisor, according to the foregoing technique, is shown by means of a motion picture film. This is, perhaps, the most accurate, interesting and vivid method at our disposal. As the simplicity of this technique gains wider recognition, I feel that it will greatly stimulate interest in this method of treatment, which has produced highly gratifying results for so many operators.

Protection of the tooth while the jacket crown is being made is an important problem. At first I used Synthetic Porcelain placed on the tooth by one method or another, but I soon learned that this was by no means the best procedure. Often the greatest objection was that the dentine became very much more sensitive during the interval. I find the making of a hood of gutta percha the most satisfactory, warming it into a roll and packing it on the tooth, being careful not to force the gingival margin back from the previously cut shoulder.

* * *

Health and Education

DR. WILLIS A. SUTTON, ATLANTA, GA.

T has long been common knowledge that the condition of the teeth has a direct bearing on the health of the body as a whole, but if the theories and experiments of Dr. Willis A. Sutton, of Atlanta, Ga., have a practical application, the health of the teeth is the panacea for all ills, from juvenile delinquency to slow school growth. Dr. Sutton delivered an address which left no doubt in the minds of his audience that the health of the teeth of school children is a paramount factor in their general health and attitude toward life, and a barometer of success in the difficult art of living.

DELINQUENCY STUDIES.

After paying a compliment to Canada, describing it as "the mid-way station between the laxity and blase attitude of the people of the United States and the conservatism of England," Dr. Sutton launched into his subject, "Health and Education," and sought to show that there is a definite relationship between the health of the child, particularly its dental health, and the progress it makes at school. To this end he told of experiments he had made in Atlanta, where he is superintendent of schools. There was no such thing as a bad boy, he contended, although there were some whom teachers thought it necessary to expel or suspend from school.

It was among these that his first experiments were made. By previous experiences he had discovered that in several cases school delinquency

* From report of public meeting published in the Montreal Gazette, 3rd November, 1926, held under auspices of the Montreal Dental Club.

could be cured by proper attention to the teeth, so, gathering together 35 boys from the Atlanta schools, he put them in a separate school building, had their teeth examined and attended to by dentists, and in a short time had nearly all of them back at school, teachable boys, good students and altogether well-behaved. In many cases abscesses of the teeth had to be removed, and it was his belief that it was these, in their effect on the general health and mental attitude of the boys, that led them to be refractory pupils.

This experiment was carried on until nearly every school in Atlanta had been covered. Through a timely donation of \$5,000 from a public-spirited citizen of Atlanta, he was able to arrange for dental examination of all the pupils and subsequent dental treatment. In this work he secured the co-operation of service clubs, women's organizations, doctors and dentists, and of 987 pupils so treated at one time, a record kept over a period of nine months showed a marked improvement both in study and attendance at school. The children were scarcely recognizable at the end of the test period.

Through these experiments he had come to realize that more efficient children could be obtained if their teeth were kept in good condition, and as their health improved the social and moral atmosphere of the whole community took on a different aspect. In another school he took fifteen pupils whom the teachers considered hopeless, and after dental treatment fourteen of the fifteen passed examinations in very subject, and only one failed in one subject.

LATIN VS. HEALTH.

Here Dr. Sutton paused to express the view that it would be better not to cram so much Latin into pupils, and devote the money necessary to the teaching of Latin to the development of health. "I would rather see the bloom of health on the cheeks of the children," he said, "than have them conjugate all the Latin verbs from Julius Cæsar backward or forward." When he suggested this in the Atlanta schools the objection was raised that the pupils could not enter the colleges without a knowledge of Latin. To this he remarked that it was a very serious thing when any institution of learning raised a barrier simply because the child had not been exposed to certain phases of education.

There was a great need, he said, for the development of a sense of individual responsibility on the part of the people, and all classes of the community should co-operate in the task of bringing about an improvement in the health of children. If a body functioned properly in every bone, every tissue and every organ, that would be, he believed, a perfectly moral body. From this he reasoned that crime, and many of the other scourges of society, could be removed altogether by the development of the national health.

The Value and Care of the Deciduous Molars

BY JOHN E. GURLEY, D.D.S., F.A.C.D., SAN FRANCISCO.



AMONG the thoughts that occasionally enter the writer's mind is this, in the form of a question: What arrangement of things would obtain if one man had had the direction of all things? Such a question may at first appear passingly strange, but when one sits down and reads the volumes of published articles and statements on any one subject, and notes the contradictions; when one observes the practices of men and notes the diametrically opposed methods; when one observes the views of men and notes the great variances between them, he often wonders how we get along as well as we do.

Further contemplation reveals first, that out of this apparent chaos we seem to get at least something of the truth, for we do progress and prosper; second, the old world plods right along in spite of the storms and turbulences of men. Statistics show that infant mortality has been greatly reduced and that the average longevity has been extended. This must be conceded to be the main object to be accomplished in the world, that is, the continuation of life, everything else being subservient thereto. And third, we must acknowledge the inability of any one man to direct all of this, for surely all of the rest of us would not listen to him.

Although there are many instances in my own mind in which development has been made, and in which no prior plan existed, yet through the beneficence of the great Director of things it was allowable, and so we have enjoyed and realized much about us, as the result of man's ingenuity. This has been worked out through the field of science, which is the instrument by means of which we interpret nature and make application to our needs.

Through this field of endeavour it has been discovered that certain animals, of which man is one, are the possessors of two sets of teeth, one replacing the other at a stated time in his growth and development.

There are a few facts to which your attention is directed, concerning these teeth of man, particularly that set which makes appearance first and is later replaced. Consider them in order:

1. Inasmuch as they serve for a short time only and are replaced, they are called "deciduous teeth." They are "deciduous" and not "temporary" teeth—deciduous means to be lost or replaced, as leaves of certain trees, and for that period for which they are intended they are permanent, hence we should discontinue the use of the word temporary in this connection. This arrangement is one pre-arranged by the great Creator, and not a development of any man or men, aided by or allowed to do so by that same power. The use of the word temporary, too, is bad form in dealing with parents or guardians of our younger patients, for they become imbued with the idea of temporariness,

whereas it is our duty to inculcate thoughts of permanency. These teeth should be retained until the proper time for their replacement has arrived, and loss before that time is a real loss. There is no such thing as "premature loss"—they may be prematurely removed, and in such a case there is an actual loss.

2 They have definite functions and transition functions to perform, which may be indicated:

- (a) There is a great difference in size between the infant and the full grown man; the infant could not use the adult's teeth, nor could the adult use the infant's teeth, hence this provision, to allow for growth.
- (b) They are essential to mastication and enunciation, and who requires this more than the child?
- (c) By virtue of their position and through their function, development of the bones of the face and head is facilitated.



Fig. 1.

If we can designate any one function as of greater value than another, then this last must be given that honour. The eruption of the permanent teeth, both at the proper time and in the proper position, is dependent upon the preceding deciduous dentition. They must not be prematurely removed nor, on the other hand, should they be retained beyond the

proper time. This time for replacement is fairly well indicated for the average, yet there are exceptions, which must be determined specifically.

It is not the writer's intention to discuss the question of delayed retention, not even the question of replacement, save only that of treatment of deciduous teeth and their retention until the proper time for exchange. There is no space retainer to compare with the tooth itself, and nothing else in the child's mouth provides this function. With this there will be no disagreement; the question remaining to be settled is that of treatment, and which I choose to discuss in sequence as follows:

DENTAL CARIES AND CAVITY PREPARATION IN DECIDUOUS TEETH.

It has been said that dental caries is primarily a disease of the teeth of children and young people. With this there can be no disagreement. There are exceptions to the rule, however, but in the main it holds true. The period in childhood ranges from about five to seven years, and in which cases or at which time there has been the natural separation of the teeth, save in the molar region, we seldom find sufficient separation to preclude the packing of food, and tooth dissolution is the result. Between these ages, then, we are most likely to find from one to eight cavities in the eight deciduous molars. Ofttimes the number exceeds this, but may be attributable to the same cause, namely, the chemico-parasitic theory. When the number greatly exceeds this, or in case of hypoplastic enamel, other factors enter into consideration, which will not be discussed in this paper.

In cavity preparation in the deciduous teeth, the rules laid down by Black for cavity preparation in general should be observed, with some modification, due to difference in anatomical form. The pulp is very large in proportion to the size of the tooth, and pulp exposure is a constant danger. The cavity may be opened interproximally with a 701 or 702 fissure bur, or if possible broken down with either a straight or biangle chisel. Following this the buccal and lingual walls are trimmed with special hatchets, and the gingival angles squared up with the same instruments. If an inverted cone bur be used in this location, scrupulous care must be exercised. The occlusal surface may be opened up with a No. 34 or 36 inverted cone bur, placed mesially to the occlusal ridge and directed distally*; this affords the best protection to the pulp and makes exposure less liable. Overhanging walls may be trimmed with the special hatchets, and in a few minutes the cavity will be ready to receive the filling. New burs, sharp burs and instruments make this work possible with practically no ill-experience to the little patient.

FILLING MATERIALS.

The wise selection of filling material is sometimes difficult, for reasons to be cited. The easiest, probably, from all standpoints is cement. But

*Vice versa for cavity in mesio-approximal

this is useless—it will not stand the stress of use, nor retain contact, which, if important in the permanent teeth, is doubly so in the deciduous dentition. The silicate cements may resist the action of the saliva a little better and might show a little greater strength, but they are hygroscopic and hence are too dangerous to use. They should not be used in the teeth of children or young people under any consideration. Gold, in the form of inlays, would probably be the best material, but for many



Fig. 2.

and obvious reasons would not be justified. There is left amalgam, which is at once most useful and most practical. Two kinds are available, silver and copper, each with its advantages and disadvantages. In pit cavities, or such as will have no undue stress thrust upon them, copper is the better. It appears to have a certain and definite therapeutic value and will in many cases actually stop the process of decay. Copper compounds are disinfectants, and that action apparently obtains within the tooth. As a filling for interproximal cavities, however, it is worthless,

for it is too soft and will not stand the stress of mastication. Silver amalgam affords desired strength, takes a fine polish, holds its margins, and in fact becomes the one of merit, save for one fact. Silver is the best conductor of heat and cold known, hence thermal shock to the pulp beneath such a filling is likely to occur, with resultant pulp destruction in due time. The writer has found a very satisfactory method to be that of lining the cavity with copper amalgam and filling the remainder with silver. In this method we have pulp protection and greater strength than with copper alone. Due, however, to their difference in electric potential, and particularly if there be a very large amount of copper amalgam

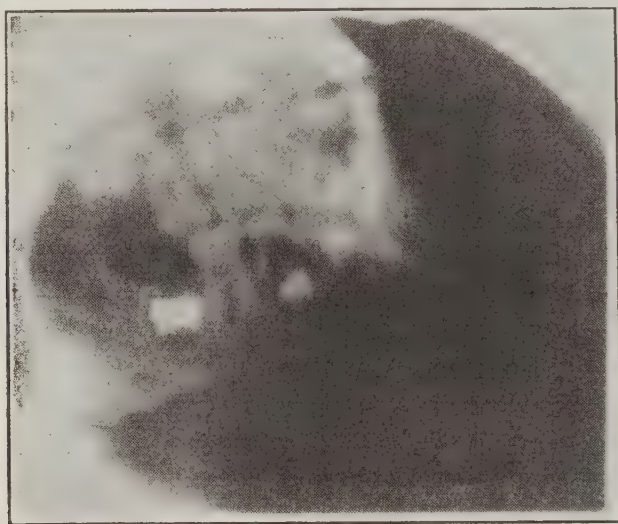


Fig. 3.

present, there may be some interchange between the copper and the tin of the silver alloy, resulting in the disintegration of the silver amalgam. It apparently is at times changed. But by using the smallest possible amount of copper amalgam, consistent with the needs of the case, the remainder of the cavity may be filled with silver and a serviceable restoration will be the result. The mesio-distal diameter must be maintained.

DISEASES OF THE PULP.

Pulp exposure is the first under this heading and should be considered according to causes, of which there are two—exposure in cavity preparation or as the result of carious process. In the former, vitality may be maintained indefinitely by capping, and should in most instances be attempted. In the latter, capping becomes at once questionable, since the pulp is more than likely infected, and in which case it had best be devitalized, though the former treatment may be accorded, and if decomposition follows, it is easily sterilized and the tooth made safe and useful.

For capping the following paste may be used:



Fig. 4.

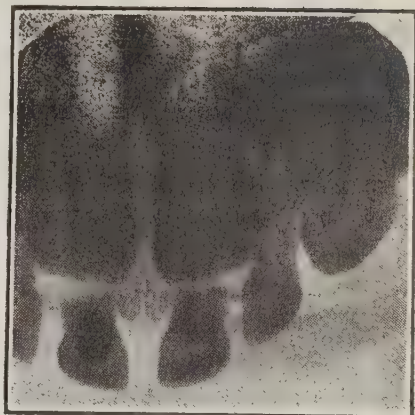


Fig. 5.

Fig. 5 was taken one year after filling and just before exfoliation, showing normal resorption as compared with its fellow.

Powder:

Tri-calcium phosphate	32 parts
Thymol	6 "

Liquid:

Thymol	5.2 parts
Menthol	2.6 "
Phenol	24.0 "

Make paste, apply over exposure, remove excess liquid with cotton pellet, cover with cement and place filling.

In case of devitalization, the writer prefers the repeated application of phenol, until the pulp can all be removed; this is slow, it is true, but safer, and it is sure. After the canals have been cleansed, they may be filled as later described.

Gangrenous pulp, acute or chronic abscess, all come in for the same general treatment, since all are infectious and sterilization is demanded. In these cases it is our custom to use formocresol as the active disinfectant. It reacts chemically with end-products of organic decomposition, hydrogen sulphide and ammonia, and will disinfect the remaining soft tissue. It is a source of real satisfaction to open up a gangrenous tooth of a child, seal formocresol, and note the change the next day or at the end of the first twenty-four hours. This may be repeated until there is no further evidence of decomposition, when a milder drug, such as chloral hydrate-thymol mixture (Grove), phenol compound, etc., may be used until such time as the case can be fully treated.

The canals are later cleansed by means of wrapped canal cleansers, washed with either hydrogen peroxide or distilled water, dried and flooded with a mild disinfectant for a few days, then dried and filled with paste as presently described.

A word of warning may need be sounded as to the use of formocresol—it is what is known as a non-self-limiting drug, *i.e.*, unless there be something for it to react chemically with, it will penetrate and destroy

all in its path, whereas phenol is a self-limiting drug, *i.e.*, through coagulation of albuminous tissue, its further action is precluded. In the use of formocresol, every precaution should be observed, so that a treatment may not remain too long, for if it is used up, decomposition goes on, with a return of trouble; or if an excess of the drug, the tissue about the tooth may be injured. Fire and water are both dangerous under certain conditions, but skilfully used, they are our greatest benefactors. So with formocresol in these cases.

THE CANAL FILLING.

After having cleansed the canal as described above, we are ready to complete the operation. This is done by placing a ball of paste, of the

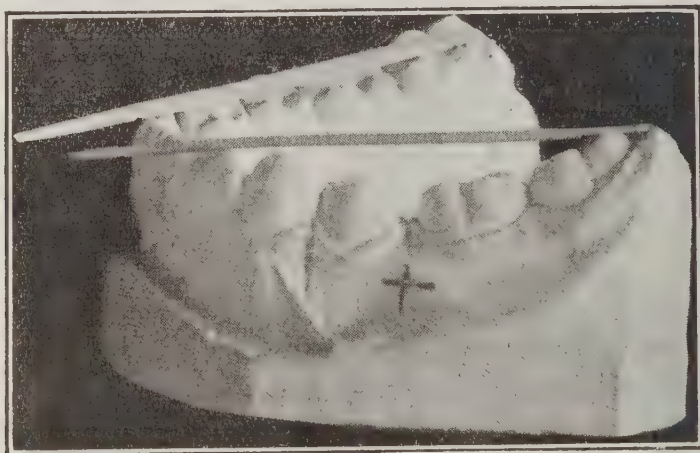


Fig. 6.

Fig. 6 shows ill results of premature extraction.

formula herewith—xeroform, 2.5; zinc oxide, 7.5; phenol gts., 15.0; glycerin, q. s.—in the pulp chamber with a smooth canal instrument, work it into the orifices of the canals, then place a ball of softened wax into the cavity and by means of pressure with the large amalgam burnisher force gently until a slight pain is felt by the little patient. Care must be used that excess be not forced through the canals, but that it will find its way from under the wax back into the cavity. This may be removed by means of a warm blade burnisher, excess wax withdrawn and the remainder burnished smooth, even into the orifices of the canals. The cavity may now be filled.

A few illustrations will show some results of canal treatment and filling. While it is difficult to show by means of the x-ray as clearly as in work upon permanent teeth, yet it must not be denied but that treatment of these cases is uniformly successful; clinical evidence is all in its favour.

—*Pacific Dental Gazette.*

Education of the Public in the Need for Dental Treatment



WE have had the most striking unanimity in all the evidence we have heard from both registered and unregistered practitioners as to the failure of the population to regard dental disease and its effect on health as in any way a serious matter. The idea that the teeth are a portion of the human body which, when they are diseased, need treatment is quite foreign to all accepted notions. Disease is allowed to progress until it becomes incurable and the teeth have to be removed. Again and again we have had evidence that people will not bother to have their teeth stopped when disease first appears but let them rot and decay until pain drives them to the dentist for extractions. The responsibility for this has largely rested with parents in the past, as they have exercised practically no oversight over the health of their children's teeth. During the last ten years various organizations have been established through which in our opinion it may be possible to affect very materially the health of the nation by a properly directed educational propaganda designed to impress upon people the importance of looking after their own and their children's teeth.

Health Visitors.—Health visitors might be instructed in the evil results to health which follow in the train of neglected teeth. At her visits to the homes of children, a health visitor has a unique opportunity of impressing on mothers the grave injury resulting from neglect of decayed teeth. Carefully worded leaflets, preferably illustrated, might be distributed. Advice is much more likely to be followed if there exist in the district dental services (maternity, school, and general) at which treatment can be obtained.

School Agencies.—Opportunities exist in great measure in the school services for extremely useful educational propaganda work. The teachers, attendance officers, school nurses, and the school dentists themselves can all do most useful work in educating the public and the children on the subject.

Welfare Supervisors.—Women suffer more from decayed teeth than men, and welfare supervisors have it in their power to persuade many girls and young women to have their teeth attended to. They will have the satisfaction of knowing that they are saving many women years of chronic ill health and suffering in later life.

Insurance Societies.—In their own pecuniary interest quite as much as in that of their members, insurance societies should neglect no opportunity of impressing the importance of a healthy set of teeth and the evil results following neglect. From the evidence submitted to us, it is clear that a society that took effective steps to ensure that the teeth of its members were properly attended to on admission to the society and, when needed, afterwards, would experience the benefit resulting from

the improved average standard of health which its members would enjoy. As far as we are in position to see there is no one factor within the control of insurance societies which will repay them so well as to concentrate on the teeth of their members. The health insurance organizations of different kinds, by advocating locally the establishment of public dental services, will be aiding the creation of machinery by which sickness will be diminished. When a dental service is set up an insurance society should never neglect to advise its members to avail themselves of its use. Perhaps of all bodies insurance societies have most to gain by the establishment of efficient dental services.

Medical Practitioners.—It is the professional duty of a doctor to do everything within his skill for his patient. We have had suggestions that doctors sometimes have failed to impress upon their patients the importance of going to a dentist when this is an essential part of the permanent cure for his illness. We were informed by Sir Donald Macalister that it is becoming more frequent for doctors to advise such preventive treatment than it used to be. We wish to recall to the medical profession the great opportunities which frequently come their way of advising with authority the necessity of preventive dental treatment.

A Public Dental Service.—Perhaps the best educator of the public in dental matters is an efficient clinic. The presence of the means of treatment becomes emphasized directly a public authority considers it its duty to provide treatment. The instruction and advice given at such a clinic spreads throughout the area served and knowledge of the ill effects of teeth neglect replaces ignorance. In a town properly served with a live dental clinic any inhabitant noticing the onset of dental decay would know it was to his interest to have it at once attended to,—
From Report of British Committee on Dentistry.

The Quality of Nitrous Oxide Manufactured in the United States*

G. W. HOOVER, WASHINGTON, D. C.



THE extensive use of nitrous oxid as an anæsthetic in dental surgery and, more recently, in general surgery, and the possibilities of its containing dangerous impurities, owing to careless manufacture or lack of control, warranted a thorough investigation by the Bureau of Chemistry of the quality of this gas available on American markets.

It has been supposed that the odour of the gas is a good criterion of its purity, and experienced anæsthetists have depended on the odour as

*Journal American Medical Association, May 16, 1925.

a guide to its purity. The safety of such a procedure, however, is doubtful.

The seriousness of the presence of even small quantities of impurities in nitrous oxid, particularly the higher oxids of nitrogen, is hardly appreciated by the average user, and the detection of these small but dangerous amounts by odour is unlikely.

Lehmann and Hasegawa, in a study on the toxicity of several oxids of nitrogen, have found that as little as 0.078 per cent. of nitric oxid, 780 parts per million, kills animals quickly (rabbits and cats), and that even one tenth of this concentration can be borne for only half an hour, while from 0.0117 to 0.0156 per cent., or from 117 to 156 parts per million, is dangerous. Results show that 0.0039 per cent., or 39 parts per million, can be tolerated by many individuals for several hours.

The preparation, analysis and purification of nitrous oxid have been thoroughly reviewed by Baskerville and Stevenson, as well as by a number of other investigators; Smith and Leman investigated the problem in 1911 for the Council on Pharmacy and Chemistry, and drew up the standard nitrous oxid N. N. R. (before it became official in the U. S. P. IX.).

Nitrous oxid is made by the thermal decomposition of ammonium nitrate, in which the products of decomposition are theoretically nitrous oxid and water ($\text{NH}_4\text{NO}_3 \rightarrow \text{N}_2\text{O} + 2\text{H}_2\text{O}$).

In actual practice, aside from the possibility of impurities derived from the raw material, such as chlorids and sulphates, it is virtually impossible completely to prevent side reactions, resulting particularly in the higher oxids of nitrogen. It is, therefore, necessary to subject the gas to elaborate purification processes in order to free it from these impurities. Constant vigilance and testing throughout the manufacturing processes, from the original reaction to its ultimate storage in the cylinder, are necessary to assure a high-grade gas.

Process of Manufacture—Purified ammonium nitrate is heated in retorts to about 240°C ., which causes the decomposition into water and nitrous oxid. Water is removed by condensation, and the nitrous oxid gas is then subjected to a series of purifications of higher oxids of nitrogen, ammonia and acid impurities. The gas is cooled, compressed to a liquid, and packed in steel cylinders under high pressure in order to keep it in liquid form. The liquefaction also serves to separate the nitrous oxid from contaminating nitrogen. During all the stages of its preparation the nitrous oxid gas is subjected to repeated tests to ensure the absence of impurities from the finished product.

Investigation of Nitrous Oxid By Bureau of Chemistry.—The bureau's survey of this industry included an examination of raw materials, the collection and examination of representative samples of the gas as found on the market in different sections of the United States, and interviews with surgeons, dentists and anæsthetists.

The findings, though gratifying in the main, show the need for a close and continued watch over the quality of nitrous oxid being marketed.

The production of this important anæsthetic in the United States is in the hands of comparatively few manufacturers. It is a highly specialized industry, and there is every reason to believe that safe nitrous oxid is being marketed. This conclusion was borne out by the present investigation of representative samples.

Examination of Samples.—Samples of gas were not only tested for compliance with the U.S.P. requirements, but were subjected to further rigid examination for the presence of nitric oxid. It is particularly gratifying to the bureau that none of the samples examined contained enough impurities to warrant action under the Food and Drugs Act. While a few samples showed the presence of perceptible traces of nitric oxid, none contained harmful quantities.

The accompanying table gives analytic data on a number of samples collected from various points throughout the United States.

RESULTS OF ANALYSIS OF SAMPLES OF NITROUS OXID

Sample No.	U. S. P. Tests					Nitric Oxid by		
	Carbon Dioxid	Odour	Halogens	Acidity	Reducing Substance	Napthylamine and Sulphanilic Acid	Reduction of Potassium Permanganate	Starch Iodid
1	Trace	O K	None	None	O K	Minute trace	Amount in 101 gm. gas not titratable	.....
2	Present	O K	None	None	O K	Minute trace	Amount in large volume of gas not titratable	.....
3	Present	O K	None	None	O K	Minute trace	Amount in 77 gm. gas not titratable	.....
4	Present	O K	None	None	O K	Minute trace	Amount in 50 gm. gas not titratable	.....
5	Approx. 0.3%	O K	None	None	O K	Minute trace	Amount in 40 gm. gas not titratable	.....
6	Absent	....	None	None	O K	Absent*	Absent	.....
7	Absent	....	None	None	O K	Absent*	Absent	.....
8	Present	O K	None	None	O K	Absent	Minute trace running gas 3 hours	Minute trace
9	Present	O K	None	None	O K	Trace	0.0008% NO	Trace
10	Present	O K	None	None	O K	Absent	Absent	.....
11	Present	O K	None	None	O K	Absent*	Absent	.....
12	Absent	....	None	None	O K	Absent	.....	.....
13	Absent	....	None	Minute trace	O K	Present 7.2 parts per million	.....	.....
14	Absent	....	None	None	O K	.....	.....	.....

* Additional nitrite tests on gas drawn from inverted cylinder was negative.

PLACING OF SOFT CEMENT.—To prevent the instrument from sticking to soft cement after it has been placed in the cavity, dip it in absolute alcohol, and keep it moist with the alcohol until the placing of the cement is complete.—*Dental Science Journal of Australia.*

Influence of Arsenious Acid on the Periodontium

ABSTRACT BY J. STANLEY BAGNALL, D.D.S., HALIFAX.

DR. GRIGORY FELDMANN, of the State University of Moscow, in the *Deutsche Monatsschrift für Zahnheilkunde* of the 15th October, 1926, gives the results of "An Experimental Investigation on the Influence of Arsenious Acid on the Periodontium in Pulp Devitalization." The investigations were designed to determine the action of arsenic on pulp and periodontal tissues, particularly the latter. Experiments were carried out by opening into the pulp canals of incisor and premolar teeth of anæsthetized dogs, taking care not to injure the pulp with the bur. In these openings a minute quantity, not larger than one-quarter the size of a large pin head, of a paste consisting of pure arsenious acid, glycerine and eosine (for colouring) was inserted. Several teeth, separated from one another by control teeth, were selected in each animal. The arsenic was left in from two to seventeen days. Thirty-one experiments were carried out on dogs running from one and one-half to six years old. At the conclusion of each experiment the animal was killed and a portion of the jaw containing both the treated and control teeth was removed and subjected to microscopic examination.

He draws particular attention to the probable penetration of the arsenic, through the dentine tubules, to the periodontal tissues, between the roots of a premolar tooth, where the duration of the application was three days. While there was only slight hyperemia of the tissues around the root apex, those between the roots showed marked hyperemia with pus-formation.

He points out in his summary of the experiments that the reaction of the pulp to the application of arsenic was expressed by hyperemia, oedema, blood extravasation, infiltration with lymphoid cells and leucocytes and partial necrosis. The severity of the changes depended somewhat on the length of the application, but was not always in direct proportion.

The effect on the pericementum varied from a slight hyperemia with cedema and infiltration by leucocytes to cell increase, pus-formation and resorption of dentine and apical portion of the roots. He is in agreement with the previously expressed opinion that these changes may be brought about as a result of the formation of decomposition end-products in the pulp canals, but stresses the possibility of the passage of the arsenic direct through the dentine tubules. While the severity of the changes depended somewhat on the length of application of the arsenic, a much more important factor was the character of the pericementum and the age of the animal. Thus the changes were much more severe in young animals than in old ones; also it was more severe in those

cases where the pericementum was rich in cells and the various tissue elements than in those cases where it was coarse and thick, poor in cells, and consisting largely of connective tissue.

The different reactions of these secondary phenomena of arsenic on the periodontium must always be taken into account clinically. The general effect on the periodontium of arsenic applied in the pulp chamber, for devitalization, is not indifferent, and is unquestionably harmful in young individuals. In these latter cases it is contra-indicated in applications of even 24-48 hours.

Dentistry in Great Britain



THE following extracts are taken from the report of the committee appointed by the Lord President of the Council, Great Britain, to enquire into the extent and gravity of the evils of dental practice by persons not qualified under the Dentists' Act:

PRELIMINARY EXAMINATION.

We think that it is essential that a student, in ordinary circumstances, should have passed a preliminary examination in general education which should be the same for dental students as for medical students. This examination should, we think, be the normal leaving examination usually passed by a pupil, after an approved course of study at a secondary school. Either the 1st or 2nd school examination would be a suitable preliminary examination before commencing a professional course of study. Latin should not be a compulsory subject for a student entering a course of professional study as a dentist. If any particular subjects of a general education are to be obligatory they should be science subjects. A knowledge of Mathematics, Natural Science, English and another language, comprises the elements of a suitable preliminary examination. The choice of subjects within each of these groups should be free.

The General Medical Council, before admitting a student to the dental students' register, have, in the past, required that he shall have passed a preliminary examination with Latin as a compulsory subject. The Council, however, has recently made Latin optional, in the senior examinations, while retaining it as a compulsory subject in the junior examinations.

We recommend that the Council shall no longer insist on Latin as a compulsory subject in any of the preliminary examinations which it accepts.

PRELIMINARY SCIENCE.

It is desirable that the course of study in Chemistry and Physics should form a portion of the normal school course. A pass in Science, with credit in Chemistry and Physics in the 1st school examination in secondary schools inspected by the Board of Education, should be

accepted as entitling a student to enter his professional examination in these subjects; a pass in Chemistry and Physics, in the 2nd school examination, should be accepted as an adequate substitute for the professional examination in these subjects. Several of the licensing bodies have expressed their willingness to adopt this course. In making this recommendation we are in substantial agreement with a somewhat similar recommendation by the Committee on the position of Natural Science in the educational system of Great Britain. We believe that a systematic course of Physics and Chemistry, spread over several years at a secondary school, is of greater value than the rather fevered six months' course in these subjects which the present dental curriculum generally requires. We are also of opinion that a dental student, before commencing a course of professional study, should have received some preliminary instruction in Biology.

THE GENERAL MEDICAL SUBJECTS.

We think that the teaching of anatomy, medicine and surgery for dental students should be special for them unless under conditions specifically approved by the statutory dental board. Suggestions that have been made to us are in the direction of lightening the portion of the curriculum dealing with general medical subjects and giving more attention to the special dental subjects. We approve of these suggestions.

APPRENTICESHIP.

Private pupilage, as an apprentice, may be an ideal way of instruction in dental mechanics under a dentist who has the gift of imparting the technique and knowledge of his craft to his pupil. On the whole, however, we are of opinion that teaching at a school is preferable to private pupilage. We think that if private pupilage is to be continued, it should be restricted by safeguards to be framed by the statutory dental board. In any case, we are of opinion that if instruction in dental mechanics should be permitted by a dental licensing body, as a portion of a prescribed course of professional training, the time devoted to it should be twice the length of corresponding instruction at a dental school.

TWO CLASSES OF REGISTERED DENTISTS.

We have received a carefully prepared scheme from the clinical dental committee of Leeds University, designed to secure rapidly an increase in registered dentists by the creation of a special class of dentists known as "certified dental operators." A two years' course of training designed to "ensure a high standard of efficiency in operative skill" was proposed. The saving in time was obtained by omitting instruction and practice in dental mechanics. It was proposed that these "certified dental operators" should be placed on a separate roll from that containing the names of the more fully qualified dental surgeons.

We do not think it desirable, for various reasons, to set up two classes of registered dentists, and we are unable, therefore, to approve these proposals.

Ethyl Chlorid as a General Anaesthetic in Dentistry

BY ROBERT M. OLIVE, D.D.S., FAYETTEVILLE, N.C.



FEW years ago, while in Boston, I attended a clinic in the Forsyth Dental Infirmary for Children, in which ethyl chlorid was used a great deal as a general anæsthetic. The simplicity of the administration, the excellent anæsthetic results and the very few, if any, after-effects, induced me to study the use of this agent. For the past four or five years I have been using it with such success that I have practically given up the use of somnoform and nitrous oxid as general anæsthetics.

The most popular general anæsthetics used by our profession to-day are nitrous oxid and oxygen, somnoform and ethyl chlorid. Of these three, the first is very popular in the United States, the second is somewhat used, while the last, ethyl chlorid, is used more in Europe, especially in France, England and Germany.

Ethyl chlorid is prepared by the action of hydrochloric acid gas on absolute ethyl alcohol. It is a colourless, highly volatile liquid, having an odour resembling that of chloroform and a burning taste. It is not irritating to the air passages.

PHYSIOLOGICAL ACTION.

Respiration is increased somewhat in depth but not in frequency. Ethyl chlorid is taken by the blood very rapidly, and eliminated with the same rapidity. The length of the administration of the gas, the degree of its saturation, and the general condition of the organism have great influence on the rapidity of its elimination. All authorities agree that in full surgical narcosis a slight fall of blood pressure is noted.

STAGES OF ANAESTHESIA.

First stage, or stage of analgesia, is characterized by the diminishing of the frequency of pulse, which is nearly always accelerated before the administration (owing, probably, to the mental excitement of the patient), a deepening of the respiration, and the beginning of moderate tension. The sensation of pain is completely abolished, although the patient is still conscious. This stage begins after five or six breaths of the anæsthetic. It is the stage before the excitement appears, and is sufficient for very short operations, such as opening of abscesses, drilling into pulp chambers, etc.

Second stage, or stage of excitement, lasts only a few seconds. Symptoms are often entirely absent, but are always present in nervous and alcoholic patients.

*Read before the joint meeting of the Virginia State Dental Association and North Carolina Dental Society, Richmond, Va., April 13 to 15, 1926.

Third stage, or stage of complete anæsthesia, is characterized by slight muscular relaxation, but not as relaxed as in ether or chloroform anæsthesia. At this stage there is complete loss of reaction to external stimuli, regular or deep respiration. The eyeballs are fixed and rolled slightly upward, and the pupils are dilated. The patient appears to be quietly asleep. This stage lasts from one to two minutes only after the operator has ceased to administer the anæsthetic. The anæsthetic should not be continued long after the third stage, as danger may occur.

Elimination of the gas takes place mostly through the lungs, especially in brief narcosis. The system is entirely free from the drug in about five or ten minutes after the anæsthesia.

AFTER-EFFECTS.

Generally speaking, if all preparatory measures are taken and the length of the administration is moderate, no after-effects whatsoever occur. In some cases, the patient has a certain dazed feeling, which disappears soon with the elimination of the gas. In very nervous and sensitive patients, in cases of prolonged administration or careless preparation of the patient, tight corset, full stomach, etc., headache, nausea and even vomiting may occur, or about the same effects may result as any other general anæsthetic will cause under similar circumstances.

SAFETY OF ETHYL CHLORID.

There is much difference of opinion as to its safety, and I believe the risk of administering this anæsthetic has been much exaggerated. Generally it is classed between ether and nitrous oxid.

Dr. Charles F. Hadfield of London, in his book "Practical Anæsthetics," 1923, says: "I have never seen a death from the use of ethyl chlorid in skilled hands. It is probably little, if any, more dangerous than nitrous oxid."

Drs. Ross, Cantlie and Mortimer consider it preferable to nitrous oxid for short operations.

Dr. S. D. Harris, interne, Forsyth Dental Infirmary for Children, Boston, in the *Dental Cosmos*, September, 1925, states: "There have been no deaths with ethyl chlorid in skilled hands and, of over 75,000 cases reported at the Forsyth Infirmary, the worst results on record are vomiting or dizziness, and these in less than 2 per cent. of the cases, handled by beginners with little training in the administration of the anæsthetic.

"Though ranked between ether and nitrous oxid, with a mortality of 1 in 17,000, the absolute lack of cases approaching even overdose at Forsyth, where the children receive practically no preparation for the anæsthetic, indicates to the most sceptical minds the absolute safety of the drug when rightly administered."

The Forsyth Dental Infirmary, by the way, is probably the largest individual consumer in the world.

Without trying to deprecate the value or safety of nitrous oxid and oxygen, I think it is interesting to state that Dr. Gwathmey, in his book on anæsthesia, 1914, states: "The probable death-rate of nitrous oxid and oxygen is, for surgical cases, one in ten thousand. This rate has been fixed from the number of cases reported to the author."

INDICATIONS AND CONTRA-INDICATIONS.

The administration of ethyl chlorid for long major operations has proved not very successful, and it seems to be generally accepted that it is wiser to restrict it to brief minor operations for which it is particularly suitable. There is no contra-indication as to age or sex, although it seems to be by far the most suitable anæsthetic for children. Many claim there are no contra-indications, though I think, to be on the safe side, we must consider advanced respiratory affections, organic heart lesions and severe kidney diseases as contra-indications.

ADVANTAGES OVER NITROUS OXID AND OXYGEN.

It is preferred to nitrous oxid when indicated (foregoing) for the following reasons:

- (1) An easier and simpler administration.
- (2) The rapidity of action and recovery.
- (3) The total absence of after-effects.
- (4) An economy of material ($1/3$) and apparatus ($1/50$).
- (5) Compactness, portability and indestructibility of the container.
- (6) Lack of tongue or mucous membrane swelling.
- (7) The beneficial psychic reaction induced by the lack of a fear-inspiring apparatus, especially in children.

ADVANTAGES OVER SOMNOFORM.

Somnoform is an anæsthetic mixture of ethyl chlorid 83 per cent. methyl chlorid 16 per cent., and an ethyl bromid 1 per cent. The old formula had more of the latter two anæsthetics in the mixture. In making up the new formula, the manufacturers have reduced those two and added more ethyl chlorid. This was done because they were aware that those two drugs were more dangerous than ethyl chlorid. They have reduced methyl chlorid from 35 per cent. to 16 per cent. and ethyl bromid from 5 per cent. to 1 per cent. The latter anæsthetic is a cardiac and respiratory depressant, with a death-rate when used alone of one in five thousand.

ADMINISTRATION.

Ethyl chlorid can be given by the open and closed methods. I prefer the open method, as there is no cumbersome apparatus to get in the way of the operator, although it takes a small amount more of the anæsthetic, as some evaporates before it is inhaled by the patient.

(1) The *closed* method, where an apparatus is always necessary. Many have been devised. The most promising is that of DeFord, and its noticeable advantage is in the fact that a patient can be kept in a state of light analgesia for a long time. Undoubtedly there are other merits, but we question the advisability of keeping a patient under the anæsthetic for twenty minutes, even with a light dose.

(2) The *open* method is the more popular, and is generally preferred because of the extreme simplicity of administration, and the absolute lack of a fear-inspiring apparatus. Since, however, the use of the closed method is beyond my scope of experience, and the open method is the more preferable, I shall pass on to it.

PROCEDURE FOR THE OPEN METHOD.

A patient up to three years of age is generally crying, and reasoning is of little avail. Attempt to divert the patient's attention, as the same time applying a fourfold gauze moistened with a little anæsthetic. After the first whiff or two, the child may hold his breath for a few seconds (if he is nervous), struggling and tearing at the gauze. Satisfactory breathing, however, immediately follows, and in two or three breaths he will quiet down. Hold the gauze firmly in place with the left hand and spray in a few more drops of ethyl chlorid. It may take from five to ten breaths to sufficiently anæsthetize the child. At point X (Fig. 1), just before or at the beginning of the stage of relaxation,

Fig. 1

Induction X			Y Maintenance	Recovery
Analgesia	Excitement	Relaxation	Return of Reflexes	Return of Consciousness
0-10 secs.	10-20 secs.	15-25 secs.		
			1-1½ mins.	30-40 secs.
Painless (operable) period, 1½-2 mins.				

remove the gauze. At this stage, a wooden wedge is put in place and may be held by the assistant. A mouth prop or wedge should never be placed in the patient's mouth until he has become anæsthetized, for it will accelerate the excitement. The anæsthesia deepens for twenty seconds, taking the patient to point Y. This is explained by the fact that it takes the last inhalation of the drug twenty to thirty seconds to travel from the lungs through the circulation of the brain. A painless period, lasting about thirty to forty-five seconds, follows, giving ample time for minor operations of brief duration, *i.e.*, generally an extraction, the lancing of an abscess, etc.

A patient from three to eight years of age is generally more open to reason. Tell him that you are about to administer a little "orange juice," which he will like very much, as all others do. Let him understand that this is special—for only the best patients. Never say, even

to an adult, that you are about to put him to sleep, unless asked to do so previously, for sleep stimulates death in a patient's mind and the term should be avoided. Instead, tell him that he is about to undergo a very pleasant experience. This is true, as explained under the physiological reaction of the nervous system, and the patient may voluntarily help or hinder you while under incomplete anæsthesia, depending upon mental preparation.

Now moisten a fourfold gauze, first with a little oil of orange or the essence of oil of bitter orange peel, which is very handy and inexpensive, and pass the gauze before his nose to prove the truth of your statement. For this purpose, I have secured an inexpensive imitation orange made of wax, cut a hole large enough in the wax orange to receive a small bottle, and then placed the bottle in the hole and sealed with yellow sticky wax, leaving a small part of the neck sticking out to receive the stopper. (The stopper may be painted green to imitate the stem.) Moisten the gauze well with ethyl chlorid and apply to the mouth, at the same time pinching the nose with the index finger and thumb. The child thus loses his sense of smell and breathes the "orange juice" freely. Raise his left hand and divert his attention by telling him to straighten the hand, straighten the fingers, etc., or by having him spell, count, answer some questions or follow some other diverting line of thought. Have the patient keep his left hand high and still as possible, for the wavering of the hand is generally an indication of point X (Fig. 1). Hence the anæsthetic should be discontinued and the operation begun. The anæsthesia further deepens to point Y or thereabouts.

A patient over eight years of age can be better prepared, and his attention more easily diverted during induction; otherwise the procedure is practically identical with the above proceeding.

Incomplete anæsthetization covers an operable period ranging from thirty to forty-five seconds (gauze removed at point X). Those operations requiring over a minute must be carried through to the complete stage (gauze removed at point Y). Though the latter method lasts more than twice as long, it produces occasionally after-effects. The administration of a second dose of anæsthetic, before the patient recovers from the effects of the first, should very seldom be attempted, and then only by the person who is extremely well versed in the use of the drug.—*The Dental Cosmos*.

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Public Dental Health Education

"The public has decided it wants health talk and means to get it! The lay press is the most powerful medium of instruction for the public in health matters. We must do our best to secure its co-operation!"—Sir Thomas Horder.

IN this department each month will be published a short article suitable for use in the public press. The material has been authorized by the Oral Hygiene Committee of the Ontario Dental Association and members of the profession may feel free to arrange for its publication in the local papers or magazines.

THE BABY TEETH.

HOW many should there be? "Ten little fingers and ten little toes"—making twenty in all—and there you have their number. Easy to remember, isn't it?

And when should you begin to look for them? About the sixth or seventh month.

And which comes first? As a rule, the lower front tooth, the central incisor.

So after all baby's fretfulness he has a brand new tooth or two—so white and so sound they look, that you never give a thought to future tooth troubles.

Then the other eighteen or nineteen white-coated little "millers" will follow at somewhat regular intervals until Sonny is two years old, when he should have his full temporary set.

These are the temporary or deciduous teeth—being known also as the "milk teeth," from which you will be aware, of course, that they won't be retained right through adult age. They should all remain in place, however, until about the seventh year, when, through the natural process of shedding, they commence to be lost.

Then, as the time approaches for the eruption of the second set, unless the first teeth are sufficiently separated in front to allow one or two thicknesses of blotting paper between them, the arches have not properly expanded and the second set is certain to be crowded and irregular. In such a case, the family dentist should always be consulted.

Since Sonny is going to lose these small teeth in good time, and get a nice new set, why bother to care for them?

Well, little Sonny does not want a tooth-ache any more than do you—and for several other good reasons, of which more to follow.

* * *

WHY CARE FOR THE BABY TEETH?

OF course, as we said, they will be lost eventually; then why bother to care for them?

First, there is the inevitable decay, as a result of neglect, with its attendant tooth-ache; and it may be that because of this destruction and pain, the tooth is lost prematurely through extrac-

tion and, as a sequence, the little jaw does not develop at this point as it would have done with the tooth left in place.

Second, there is this other danger, that with the too early and meddling extraction of the temporary molars, there is the grave possibility of bringing away, or otherwise destroying the developing bicuspid, which frequently lies within the spreading roots of the former tooth.

Third, there is the reverse condition where the temporary tooth is retained too long because of interference, through pulp disease, with the natural process of shedding, thus causing the succeeding tooth to erupt out of place, or not at all, either of which is bad.

From any or all of these causes, little Sonny is going to have some crooked teeth in his second set, and a mal-formed jaw, which means a facial deformity of greater or less degree.

Fourth, it is further true that neglect of these "baby teeth" may bring about more serious results than equal neglect of their successors, since decay will make much more rapid progress in them than in the larger and better developed teeth of the second set.

Above all, remember that these little teeth are to serve Sonny throughout the formative period, which includes the years of his greatest growth and development, and that his growth will depend largely on his ability to properly masticate his food, which ability is exactly proportional to the soundness of his teeth.



THE CARE OF THE BABY TEETH.

PARADOXICALLY speaking, the care of baby's teeth should begin before they arrive.

A soft cloth should be used daily to cleanse the gums and keep them healthy before the coming of the little teeth.

Symptoms of tooth eruption in the young child are, as a rule, not lacking. Locally there will be slight inflammation, with swelling; the area in which the tooth will erupt showing a tenseness and shininess of tissue. The child will exhibit a tendency to bite at anything, such as its toes, fingers, etc., and evidence a general irritability and restlessness, accompanied, possibly, by a slight fever.

Should the eruption of the tooth seem too tardy and cause the child considerable pain, the family dentist should be consulted.

As soon as the first tooth has erupted the use of the mouth cloth should be supplemented by a soft brush, using clear water in the daily brushing. Later, when the child has reached the age when it will not swallow everything that is put in its mouth, a little good dental cream may be put on the brush.

However, along with these efforts, attention should be given to a correct diet, and the parent should insist on proper mastication of its food by the child.

Little children should not be allowed to eat candy or other sweets; they are ruinous to the young teeth.

It would not be too early to take the child to the dentist at two and a half or three years of age, and thereafter at intervals of from three to six months, as may prove necessary. In this way, small cavities can be detected early and treated with practically no discomfort to the child, and so the teeth are preserved from further and extensive decay.

* * *

PRE-NATAL DIET.

THERE is a phrase respecting motherhood "for every child a tooth"—which is to say that during the period of formation of the little life certain changes take place in the mother's teeth, causing them to decay and be more easily lost. And this is so! But why?

For the rearing of the little structure that is so quietly proceeding, the little bone-builders in their construction of the bones and teeth, depend chiefly on the calcium salts. Should the mother's diet be deficient in these building-stones, the little workmen are obliged to go to the only other available sources of supply, the bones and teeth, to meet their wants. Robbing Peter to pay Paul—if you will—yet the little structure must be reared at all costs. In such a case the mother's teeth are so structurally weakened as to invite disease.

Not only to avert this disaster to herself, but keeping uppermost the welfare of the coming infant, and remembering that she must contribute generously towards the influences that will make for normally developed teeth in her offspring, the expectant mother should select her diet with the utmost care. Hence she should choose plenty of lime-containing foods—milk, eggs, cereals, the leafy-topped vegetables and fresh fruits.

Following birth also, the demand for calcium in the mother's diet is still high, since, with the infant feeding naturally as it should, the mother's milk requires large amounts of these salts. An inadequate diet on the mother's part certainly affects harmfully her own teeth as well as those developing in the nursing child.

Moreover, it should be stressed that if the teeth are to be of good quality the infant should at this time be naturally fed. The ravages of tooth decay have been found to be much greater among children who as infants had been artificially fed.

The expectant mother should take at least a quart of milk a day in addition to her other food. This will ensure a proper start of the teeth in the jaws of the infant at birth, and as well the proper bony development of the child generally.

PAIN AFTER EXTRACTION.—A pledget of cotton-wool soaked in dentalone and placed in socket of extracted tooth will immediately relieve the pain which often occurs.—*Australian Journal of Dentistry.*



PUBLIC HEALTH SERVICE

FOR THE PEOPLE ~ BY THE STATE

This Department is Edited by

FRED J. CONBOY, D.D.S.,

Director of Dental Services, Province of Ontario.



THE following account of the activities at London on the Ontario Dental Health Day gives some idea of what can be accomplished in connection with public dental health education, and may serve as a guide to the dentists of some municipality undertaking similar work.

"We co-operated with the central committee in as many ways as possible, using their posters and stickers. In addition to this we had billboard advertising throughout the county, and had printed 600 slogan cards for different merchants putting on window displays. We also had printed 900 automobile stickers and 300 large window display cards, advising the people of the nature of Dental Health Day, and where the clinics were situated in the County of Middlesex. The committee felt that we must get in touch with the individual throughout the county, and with this idea in view sent out 20,000 notices to the different homes, advising the parents of the idea of Dental Health Day and the location of the different clinics.

"We had speakers at the different teachers' conventions, discussing Dental Health Day, and in addition to this wrote some 200 teachers throughout the county a letter, a few days before Dental Health Day, again drawing their attention to this Health Day. Speakers were supplied and addressed approximately 25 Mothers' Clubs. We also supplied speakers to Strathroy, St. Thomas and Woodstock, and some of the Welfare Associations of the manufacturing plants of the city. The different Women's Clubs, Mothers' Clubs and Welfare Associations were written, and we received their active co-operation. Speakers on Dental Health were supplied to the different Service Clubs, and the play, "The Bad Baby Molar," was put on at the Lions and Kiwanis Clubs. This play was also put on at approximately ten or a dozen Mothers' Clubs, and is still being used.

"The local Post Office used a die in their cancellation machine, advising the public of Ontario Dental Health Day. The committee interviewed Kellogg's Corn Flakes Company, and they put on some special province-wide advertising. We also interviewed Mr. Reid, President of the London Life Insurance Co., and secured his active

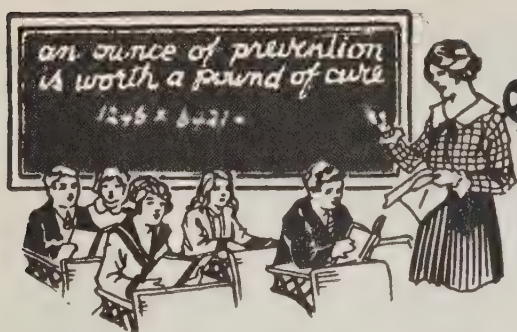
co-operation with regards to the different insurance companies sending out circulars on "Dental Health" to their different policy holders.

"The different clergymen were written a personal letter and asked to announce Dental Health Day from the pulpit the Sunday preceding it. A radio talk was given from the local radio station. On the Saturday preceding Dental Health Day the local papers issued a special edition, emphasizing the importance of dental health. The different milk and bread companies gave us their co-operation by using our stickers on their wagons, and the grocery, fruit and drug stores put on window displays, some of them being very creditable. Five hundred pamphlets on "The Care of the Teeth" were sent to the teachers and responsible people throughout the county. Throughout the city the pupils in grades 5, 6, 7 and 8, were given an examination in Oral Health on this Day, and the fact of it being Dental Health Day was brought to their attention. Throughout the county an essay contest was held for the third and fourth books, prizes being donated by the London Dental Society. Throughout the county we held 17 clinics, some of them being situated in dental offices and some in different locations just opened and equipped for the day. The committee felt that in the City of London we should have some distinctive Dental Health Day clinics, and with this idea in view we operated six clinics at convenient places for this day only. The movie film supplied by the central committee was shown at the local theatres, and also at Strathroy.

"Between 1,700 and 1,800 people presented themselves for examination in spite of the miserable weather. This was a smaller number than we had hoped for, but under the circumstances we feel that the result is very creditable and cannot be judged only by the numbers presenting themselves at the different clinics. We discouraged the attendance of any school children from the city, but encouraged them from the county. In connection with this, we would like to mention the fact that from one county school, situated about five miles from the city, 68 pupils out of a class of 70, walked through the snow and rain, accompanied by their teachers, to attend one of the clinics in the city. We feel that all our efforts were more than repaid by the interest shown by this one school.

"We feel that the results of this day will be far-reaching and cannot be judged merely by the attendance at the clinics."

SUBSTITUTES FOR PLATINUM.—It is reported that as a substitute for platinum, German chemists are producing alloys of aluminium and silver whose surfaces have been dusted with platinum black and then hammered or subjected to heavy pressure. Alloys of this kind are on the market under the names "Alargan," "Platalargan," and "Platnik." "Alargan" consists only of aluminium and silver; "Platalargan" contains, in addition, platinum, while "Platnik" consists of nickel and platinum.



School Dentistry

This Department is Edited by

EDMUND A. GRANT, D.D.S

Director of Dental Services—Department Public Health, City Hall, Toronto.



We are anxious to receive for publication in this Department reports of work carried on in School Dental Centres anywhere in Canada. Papers on any phase of Pedodontia would also be welcome.—E.A.G.



UNDER the caption "Parents Have Rooted Objection to Doctors Examining Children," Canadian newspapers recently published an Associated Press cable from London stating that "Parents of London children attending council schools have a rooted objection to their children being examined by doctors, and more so to acting on the advice of the London County Council regarding teeth.

"An official declared that 50 per cent. of parents refused advice after examination of their children's teeth.

"Some of the letters written to school masters in protest are recorded by the council. One says: 'I desire my daughter's teeth to remain as they are. The same power that placed them there will make due change when necessary.'

"Another wrote: 'Teeth will drop out and the second teeth will never come if the first are removed.' This is an old superstition much believed in England.

"One mother wrote: 'Father has had toothache all his life, so the child will have to put up with it.'

"Another asked: 'What was our teeth given us for but to eat with, and you want to drop them?'

With regard to eye treatment the parents are just as bad.

"Squint is God-given," wrote one. 'It is wrong to tamper with it.'

"Another said: 'Father has squinted all his life and sees quite well without glasses.'

"Another asserted: 'Dad has been living all his life with only one eye.'

Whatever may be said of the conduct of public clinics, for dental treatment, no thoughtful parent objects to systematic examination of the teeth of school children and their instruction in oral hygiene. Objections

such as the above are frequently made at the inception of school dental services, but as the dental education of the parents progresses, they appreciate the value of a preventive school dental service and give it their unqualified support.

* * *

Public Dental Health Activities in Ontario



THE following is a report of the Dental Health Day Activities in North York Township.

North York has seventeen schools receiving Health Service. Of these six took part in an Essay Writing Contest. Subject, "How to Make Good Teeth." Essays were limited to one hundred words. A prize of One Dollar was awarded the winner in each school. This was deposited in the local bank as a savings account. and bank book presented to pupil by Health Nurse on the afternoon of Oct. 20th. The best of these six essays were published in the monthly *Health Bulletin*. First prizes donated by Dr. C. E. Hill, M.O.H.; Reeve Hicks, Chairman of Board of Health; Mr. Hearn, member, Home and School Club (Willowdale), and Red Cross Society. Second and third prizes by dentists examining papers.

Senior pupils in a number of the schools had a poster-making contest. Teachers in the primary grades used pictures, blackboard and stories as illustrations. In all grades health talks were given by either teacher or nurse.

Tooth brushes were sold and demonstrated for first time in schools. Automobile stickers available at the nurse's office were used.

Large posters illustrating the need of dental health were placed in the municipal building, stores, schools, etc.

On both sides of Yonge St., from the city limits to Steele's Corners, drug stores had window displays of mouth toilet preparations. Grocery and fruit stores displayed proper diet.

The local paper printed an article on Dental Health, and the monthly *Health Bulletin* devoted its entire issue to the subject.

The local dentists held free examination clinics in their offices. The school children especially took advantage of this. In the Willowdale-Lansing area, one hundred were examined. Cavities in second teeth were found, numbering one to eleven per child.

Surely this should convince on the need for dental work in the rural areas.

Dental Health Day in North York was well worth the effort. Should we have one another year we would welcome any suggestions from your department.

All of which is respectfully submitted.

(Sgd.) CARL E. HILL, M.B.,
Medical Officer of Health.



British Columbia—

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Medical Arts Bldg., Montreal.
PAUL GEOFFRION, D.D.S.
308 Sherbrooke St., Montreal.

Provincial Editors will appreciate receiving from all local societies copies of papers, society proceedings or personal notes, for publication.



MARITIME PROVINCE NOTES.

THE regular monthly meeting of the Halifax Dental Society was held on the 23rd of November. Drs. Climo, Logan and Woodbury were asked to open a general discussion on the "Root Canal Problem." Rather than waste time by a certain amount of repetition, they prepared a brief of their views, which was read by Dr. Climo. They placed particular stress on the question of diagnosis and the various methods which might be used in the diagnosis of the condition of the pulp. This was followed by a classification of the different types of patients with regard to pulp treatment, then the different types of pulp infections dealt with and the probable prognosis in each type of case. The paper was followed by a general discussion which did much to bring out the various phases of the root canal problem.



The first banquet of the Dental Students' Society of Dalhousie University, for quite a few years, was held on November 26th. The dental members of the Faculty were present as guests. Mr. Barret, President of the Society, and the special committee in charge of the arrangements, are to be congratulated on the tremendous success they achieved.



An exhibit which was arranged by the Nova Scotia Institute of Science particularly to give the general public some insight into recent advances in science, and which included such dental exhibits as the casting process, the x-ray, etc., shows the great interest the public is taking

in health problems. The building was thronged far beyond its capacity, and when the sessions closed on Saturday evening lines of people were still waiting to see the various exhibits. One thing which drew a lot of attention was the projection on a screen of a particularly good microscopic slide of developing anterior teeth.

* * *

QUEBEC.

DEATH has come to two of the older practitioners of this Province this month, and it is with deep regret that we report the passing away of Dr. Stanley Burns and Dr. Newell Fisk, who was 88 years old.

A. N. J.

* * *

EASTERN ONTARIO.

DR. J. A. AMYOT, Deputy Minister of Health, addressed the December meeting of the Ottawa Dental Society on "Diet." Dr. Amyot is always instructive and entertaining.

Dr. I. Ante presented an all-day Clinic on Dentures before the Dental Study Club of Ottawa, at their rooms, 245½ Bank Street.

S. J. McC.

* * *

ONTARIO.

ST. CATHARINES AND DISTRICT SOCIETY.

THE January meeting of this Society was addressed by Professor A. E. Webster, of the University of Toronto, under the extra mural plan. Two sessions were held. At 4 o'clock the subject was "Pedodontia," and after dinner Dr. Webster lectured and led in a discussion on "Root Canal Therapy."

An excellent representation of practitioners from the city and surrounding localities was present. The next meeting will be held jointly with the Niagara Falls and District Society.

TREATMENT FOR SENSITIVE OCCLUSAL SURFACES OF MOLAR TEETH WORN BY ATTRITION.—Make a saturate solution of silver nitrate crystals, with which slightly moisten a small piece of blotting paper to cover the sensitive, abraided occlusal surface areas. Protect the cheek and tongue thoroughly with cotton rolls, and have the patient close, and hold a firm, steady pressure for from ten to twenty minutes, with the silver nitrate solution on the blotting paper between the teeth over these sensitive areas.—*Dental Digest*.

DIRECTORY of DENTAL MEETINGS & OFFICIAL ANNOUNCEMENTS

*Dental Associations are invited to use this Department Freely for
Announcements of Meetings.*



ONTARIO DENTAL ASSOCIATION AND CANADIAN DENTAL ASSOCIATION—At
Toronto, May 16, 17, 18, 19, 1927.

THE DENTAL SOCIETY OF WESTERN CANADA—Edmonton, Alta., May 25, 26, 27, 1927.

THE AMERICAN DENTAL ASSOCIATION—Detroit, Mich., October 24, 25, 26, 27, 28, 1927.



Officers of Canadian Dental Organizations

*Oral Health will be Pleased to Receive Additions or Corrections that Directory
of Names May be Kept as Accurate as Possible*



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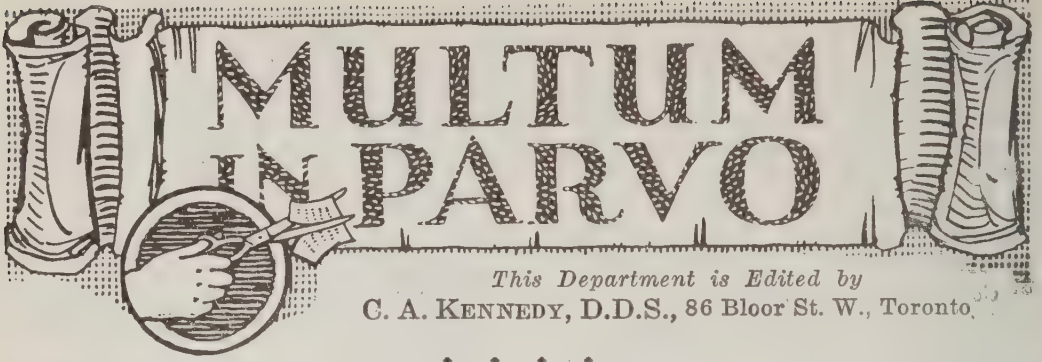
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Surgeons of B.C., Vancouver, B.C.



DOUBLE-ROOTED CANINES.—A correspondent in the *Dental Cosmos* reports three cases of double-rooted lower canines in different patients. In every case the patients were women of about thirty-four years of age; and in each case the double-rooted tooth was on the left side. Information as to the corresponding teeth on the right side is not given, presumably because those teeth are still *in situ* or had been extracted before the writer saw the patients. If the right lower canines are still in position in any or all of these patients, it would be interesting to ascertain the condition of their roots by means of radiograms.

TREATMENT FOR PYORRHOEA.—The following is a suggestion for the treatment of pyorrhœa as I have been treating it for the past two years, with the best results of any treatment I have used. After using scalers to remove all of the calculus formed, wash the bleeding gums as thoroughly as practical with equal parts of liquor antisepticus (N.F.) and hot water; apply U.S.P. lactic acid under the swollen gingival margins and in the pus pockets, and wash away the surplus with warm water. Direct the patient to return every three or four days and repeat the scaling and treatment. Magnesium sulphate on a wet toothbrush as a tooth powder is used three times daily. The swelling of the gum subsides and the scaling can be done more thoroughly at each visit. Examine the gums, and when they are healthy the use of the magnesium sulphate is discontinued.—*Dental Cosmos*.

A DRESSING FOR CARIOUS CAVITIES.—Mix zinc oxide and eugenol or oil of cloves into a thick paste, incorporating a few fibres of cotton-wool. For sealing arsenical dressings, it is well to place a small piece of the zinc oxide dressing at the gingival edge of the cavity first, then the arsenious acid, and cover over with the remaining part of the dressing. This method prevents leakage, and is easier to insert than gutta-percha. A smear of vaseline in the mix of the dressing will prevent it from becoming too hard and facilitate its removal. This dressing remains in a perfect condition in the mouth for a number of years, and was extensively used at the war, and found invaluable in exposed nerve cases as a temporary filling. It is quickly inserted and is impervious to moisture.

Do not seal a cavity of a tooth having a decomposed nerve without first treating the nerve canals.—*Australian Journal of Dentistry*.

Oral Health

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TORONTO, JANUARY, 1927

No. 1

EDITORIAL

Another Milestone



As we grow older we acquire the habit of considering New Year's Day as one more milestone along the journey of life. In earlier years we were wont to count our Milestones in terms of Birthday Anniversaries, but it is surprising how soon we reach the place where we try to *forget* rather than to *remember* our birthdays. We are disposed rather to choose the close of the year for our annual inventory of development and progress.

Occasional introspection and reflection are excellent practices and the new year lends itself admirably to contemplation of the past and resolves for the future. Busy people nowadays find too little time for such things.

As Canadians we have every reason to look to the future with faith, hope and courage. Both as citizens and as members of the dental profession, a great task awaits each one, and our hope is that we may prove ourselves worthy of the opportunities for service that will certainly present themselves during the coming year.

Regarding ORAL HEALTH it seems but yesterday that we started its publication, yet a glance at the title page shows that this is number one of volume seventeen. It hardly seems possible that this little journal is starting on its seventeenth year. We have endeavoured to give the Dental Profession in Canada and Newfoundland a magazine that would not only be of interest, but serve a useful purpose in the development of Dentistry as a health service, and sincerely thank all those who have contributed to make this possible.

We enter the New Year full of enthusiasm and with happy thoughts. Let us resolve to make 1927 a year worth remembering, bestowing charity, kindness and forbearance upon those with whom we come in contact. To each and all we extend the best of good wishes and hope the New Year may bring you and yours great accomplishment, happiness and abundant good health.

Correspondence

WHAT'S THE MATTER WITH THE YOUNGER MEN IN DENTISTRY?

DEAR DOCTOR:—I have observed that men in the Dental profession lose interest after a few years, and cultivate their lives by interests very far removed. If some of this time were devoted to professional affairs, I have no doubt that every obstacle would vanish and Dentistry would progress many-fold in the next few decades.

In the recent R.C.D.S. Board election in one district only about 80 voted out of a possible 140. Does that suggest any enthusiasm or professional interest? The other 60 expressed plain indifference and lack of opinion.

I recently made a survey of the 1,850 dentists on the Ontario list, and found that 960 of them graduated from 1915 to 1925. A survey of the Ontario Dental Association and Provincial Board reveals that no one graduating since 1908 is in any executive way connected with any of these activities. Is it fair to the graduates since 1908 that their training in these activities be delayed till the moment full responsibility is at their door? Must a man grow old, bald and grey before he can serve the profession? If so, it looks as if there were no future for the man who wants to do all in his power to further professional interests. I wonder if this is one reason why some men sink behind the four walls of their offices to professional oblivion, and stolidly refuse to move from that resolve. They will not readily give their reasons for their attitude; maybe the air would be cleared a bit if these men would write what they think.

The Dental Profession can have a grand record for 1927 if every last man will resolve to further professional interests in every possible way, not only by attending meetings, but by making meetings happen where none were before.

These things will never happen as long as we are all satisfied with things as they are.

(Signed) HAROLD D. MORRIS.

PLACING X-RAY FILMS IN MOUTH.—X-ray films should always be placed so that the coronal portion of the film is about one-eighth of an inch above (or below, according to whether it is a lower or upper tooth) the crown of the tooth. Not only is uniformity in a series of pictures thus obtained, but the tendency of the film to slip rootwise, and hence, not picture the complete crown, is counteracted. Incipient proximal cavities are often missed when the complete crown of the tooth is not radiographed.—*Dental Science Journal of Australia.*

SAD is the day for any man when he becomes absolutely satisfied with the life that he is living, the thoughts that he is thinking, and the deeds that he is doing ; when there ceases to be forever beating at the doors of his soul a desire to do something larger which he feels and knows he was meant and intended to do.

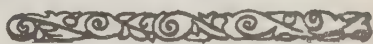
—*Phillips Brooks.*



JOHN W. CLAY, D.D.S., CALGARY, ALTA.,
President Canadian Dental Association.

ORAL HEALTH

*A JOURNAL THAT STANDS FOR THE OUNCE OF
PREVENTION AS WELL AS THE POUND OF CURE*



Vol. 17

TORONTO, FEBRUARY, 1927

No. 2

An Open Letter to the Dental Profession of Canada, From the President of the Canadian Dental Association



ANY there are who have watched those remarkable biologic changes which occur in the life history of certain insects. Tucked away in the form of a chrysalis, to the casual observer there is no indication of the change in form and function towards which they are steadily moving. At the proper time, however, the covering is parted and a new phase of existence is entered. In a similar manner the way has been prepared for the marked changes which it is now proposed to make in the Canadian Dental Association.

The formation of the Canadian Dental Association, over twenty years ago, was the result of the vision of men who saw Canada as a Dominion and not a group of provinces, and who felt the need of all elements in the population doing their share towards that desirable end. As Mr. Graham Spry, the general secretary of the Canadian Clubs of Canada, has said recently, in referring to the varied difficulties which face us:

"Such a nation, if it wills to exist and grow, must be more interested in its problems, more aware of its needs, more responsible for its policy, than a nation whose frontiers are found in the book of nature, or whose shores bespeak inevitable unity. Canada was not designed by geography to be a nation. She must be made so by the will of her people. The general will of the Canadian people will constitute the Canadian nation, or it will not be constituted at all."

Some idea of forging one of the links which would help to constitute the Canadian nation must have been in the minds of those who first formed the Canadian Dental Association. Certain it is that it is the various links of association in the various walks of Canadian life that constitute our hope of unity in the future. As such the Canadian

Dental Association has, at least to some extent, justified its existence.

From a purely dental standpoint the results of later years have been disappointing. Conventions held at outlying parts of the Dominion have only been, except to a limited extent, attended by those within the province. This has not made possible meetings such as should bear the name of a national organization. In larger centres the meetings have been carried through at considerable inconvenience, and with interference to local organizations, and perhaps with not enough general interest to justify the occasion.

As constituted, it is realized that the Canadian Dental Association is not filling the place in Canadian dental affairs which it should do. However, none will deny the need and value of a Dominion-wide body, bringing together representatives from the various provinces.

There is still a great need of every effort being made to unify and unite the people of the various parts of our country, and a Dominion body of delegates, meeting together at intervals to discuss dental affairs in Canada, is no inconsiderable factor in helping bind us together. Whether we come into closer relationship or not, depends to a great degree on the maintaining and developing of such inter-provincial links.

As Canada takes on national status it is inconceivable that there should be no national organization to deal with other national bodies and discuss problems affecting the whole dental profession of Canada. At the present time there is need of a well-organized and representative body to consider the relations of Canada and Canadian dentists with the American Dental Association.

Public Dental Health Service is also being considered more seriously, and its need more appreciated. The Federal Government maintains large services of great variety, and it is reasonable that within the near future a Federal Dental Health policy should be formulated, not only for these services, but also as part of its general interest in the health activities of the nation.

These, and other important matters, which are of general interest, are the justification for the appeal to all of the provinces to support the re-organization of the Canadian Dental Association.

These facts have been in the minds of those interested for some time. They have been seized with the need of holding together a Dominion-wide body, and so has slowly crystallized the idea of a complete change in the form, and to some extent, the function of the Association.

Elsewhere in this issue is published a copy of the letter sent out by the Secretary of the Association to the provincial secretaries, outlining the changes which it is hoped to establish.

The proposal as outlined at the Halifax meeting must not be considered as a fixed and unalterable foundation on which to build. The main purpose was to commence changes in the Association that, as

quickly as possible, there should be brought together a representative body of appointed representatives from every province, who would draw up a workable constitution. It was suggested that some such plan as that of the American Dental Association should be developed.

Defects in the plan, even as far as it is outlined, are readily apparent. That provinces with small dental population and small financial contribution should sit in on equal terms with the Provinces of Quebec and Ontario does not appear just. In the one case one delegate represents only a few, and in the other case many hundreds of dentists. This and other major problems will have to be settled, and it is hoped the delegates will attend the meeting in May, having given the whole question much thought, and having been assisted by the considered opinions of their confreres whom they represent.

The courtesy of the Ontario Dental Society, in extending an invitation to the Canadian Dental Association to meet in Toronto as their guests, is much appreciated by the executive of the Association, as it will also be by those members who may be fortunate enough to be able to attend the meeting.

With the hope that the Canadian Dental Association, as it is to be constituted, will receive the support of every province, and that a period of great usefulness to the dental profession of Canada may follow, I am,

Faternally yours,

JOHN W. CLAY,

President.

Letter From the Secretary of the Canadian Dental Association



STEPS were taken at the last meeting of the Canadian Dental Association to make certain changes in the Constitution of that body, which would serve to make it more national in its aim, and to more efficiently represent the Canadian Dental profession.

It is, perhaps, hardly necessary at this time to emphasize the need of a national organization in Canada. Problems of vital interest to the welfare of the Profession in Canada are continually rising. These can best be handled by a national body, both because the problems would be handled in the same way in all the provinces, and because the strength of an organized national body would be behind it. The Canadian Dental Association, as organized in the past, has failed to achieve much that it otherwise might have, for several reasons.

1. Because there has been a lack of continuity from one term to the next, since there was no plan for carrying out the aims of the Association in the intervals between meetings.

2. Because provision was seldom made to carry out routine business, apart from the scientific sessions of the meetings.

3. Because active membership was limited to those attending meetings.

4. No attempt was made to assure a regular source of income.

It was proposed, therefore, at the meeting last August, to have the Association reorganized along plans similar to those which have been so successful in other bodies, such as the American Dental Association. That is, that the business of the Association should be carried out by a Board of Delegates, consisting of two delegates appointed by each province. This Board could be so elected as to provide for the necessary continuity, as is done in other bodies of a similar nature. They should meet once a year and act as the executive body for the Profession of Canada. This body could decide the time and place for holding conventions, so as to best meet the particular Canadian conditions.

To finance the organization, it was proposed to ask each Provincial Organization to contribute fifty cents per registered dentist per year.

It is desired that two duly authorized delegates from each Province meet together at the earliest possible date to formulate the changes necessary in the Constitution to bring this about. The plan should then be submitted to each provincial body for its approval, and would become effective on a majority vote in each Province. The Ontario Dental Convention at Toronto, May 16, 17, 18 and 19, when dentists from all the provinces would likely be in attendance, has been suggested as the most suitable date. The meeting of these delegates would be called one or two days prior to the Convention, so as not to interfere with their attendance. Later, when the scheme matures, each delegate to the succeeding annual conventions would receive a reasonable payment from the general fund, proportionate to the distances travelled in attending the meetings.

Will you, therefore, take this matter up with your Association, or Provincial Board of Delegates, at the earliest possible date, with a view to having two duly authorized delegates appointed from your Province? The early appointment of these delegates in each Province will go far to assist the success of the meeting, since it will be necessary to supply each delegate with all available material from other organizations of a similar nature, such as the American Dental Association, Canadian Medical Association, British Dental Association, etc., so that they may be prepared to discuss the problem to the best advantage. You will readily understand that to put a scheme of this nature into operation requires some time. It will probably assist the putting of the scheme into operation if your Provincial Association would authorize your delegates to say that your Province is prepared to finance the Canadian Association House of Delegates, as proposed above, at the first meeting of the body after the acceptance by your Province of the Constitution which is to be drawn up next day.

J. STANLEY BAGNALL.

Secretary-Treasurer.

The Future of Anaesthesia*

SAMUEL JOHNSTON, M.A., M.D., C.M., F.A.C.P., TORONTO,
CANADA. LECTURER IN ANÆSTHESIA, UNIVERSITY OF
TORONTO; CHIEF OF ANÆSTHESIA DEPARTMENT,
TORONTO GENERAL HOSPITAL.

IN this workaday world we cannot rest content with the achievements of the past or the progress of the present. Although anæsthesia has passed the venerable age of three-score years and ten, I cannot challenge your attention more dramatically to its age-old value than to ask the question, what would happen to-morrow if anæsthesia were blotted from the world to-day? The whole structure of modern surgery, a great part of medical practice, and most laboratory research would go crashing into the abyss of oblivion. Can you conceive of life going on without surcease from pain in face of the fact that, day by day, as many casualties of peace drift into our hospitals as were evacuated from the trenches in the war?

HISTORICAL CONSIDERATIONS.

Commonplace as anæsthesia has become to us, it remains so vital a concern to the public that in the United States the only members of the medical and dental professions in the Congressional and New York University Halls of Fame are Crawford W. Long and William T. Morton—those imperishable figures of the first use and public demonstration of etherization for painless surgery. Nor should we forget that had it not been for other immortals of anæsthesia its beneficence might have been lost to us, even after its discovery and demonstration. At a time when the utility of anæsthesia in surgery hung in the balance of space, John Snow went into the laboratory and gave the specialty a scientific interpretation and developed satisfactory methods for clinical use. In so doing he became the founder of that illustrious line of research workers and anæsthetists who have graced the specialty since his day.

Had Sir James Young Simpson lacked the courage to defeat the entrenched religionist, or had Her Majesty Queen Victoria failed him in personally approving chloroform *à la reine*, our women of to-day, under the curse of Eve, might still be bringing forth their children in pain and sorrow.

What of dental anæsthesia, had Wells, Morton, Colton and Evans been timid and unventuring souls instead of the intrepid pioneers they

*Presidential Address presented before the Fifth Annual Congress of Anæsthetists, the Associated Anæsthetists of the United States and Canada and the International Anæsthesia Research Society in Joint Meeting with the Sections on Surgery and Anæsthetics of the British Medical Association, Nottingham, England, July 22-24, 1926. Courtesy of the British Medical Journal.

were? We still believe that painless surgery was welcomed with open arms by many, despite the fact that when Hickman memorialized the French Academy Gerardin and his associates denounced the claims of anæsthesia as a chimera, and only Larrey, of later Napoleonic fame, believed in him. Even in the sixties General Grant had to override the bitterest opposition of his own army medical service in giving Morton a special field ambulance, and permission to anæsthetize the wounded rebels and Yankees in the later campaigns of the Civil War; thus 10,000 were spared the conscious agony of sitting in at their own operations.

Assembled as we are to-day, we think of anæsthesia as having permeated the known world, and yet among the nations of hundreds of millions of souls painless surgery is as primitive now as it was among the Scythians and Incas and in China in the days of Hoa-tho! When we consider the future of anæsthesia, what of these numberless hordes? In our own midst, how many countless things are done in our hospitals, clinics, offices, and the homes of our patients, with never a thought of pain relief? This is one of the remaining cruelties of medical practice, and must pass before we are really entitled to the affection and esteem of the public, who look to us to deliver them from unnecessary suffering.

ORGANIZATION.

Organization has been the slogan of progress in all ages, and anæsthesia has had its full quota. The famous old London society, now the Section of Anæsthesia of the Royal Society of Medicine, this Section of Anæsthetics of the British Medical Association, and the Scottish Society of Anæsthetists, all have their counterparts in the Associated Anæsthetists of the United States and Canada and its five regional societies—the Canadian, Eastern, Mid-Western, Southern, and Pacific Coast.

Whether further regional organization would advance the progress of anæsthesia in the British Isles and the status of British anæsthetists, is something for your discreet consideration. But this recognition of anæsthesia by the British Medical Association leads us to hope for the development of sections or societies in the colonies, especially Australia, New Zealand, and South Africa, where interest in this connection is already rife.

In our experience in the United States and Canada regional organization has been found very influential. Our Congresses of Anæsthetists are usually held at the same time and place as the annual meetings of the American Medical Association; the Canadian Anæsthetists meet with the Canadian Medical or some Provincial Association; the Eastern and Mid-Western Anæsthetists usually hold joint sessions during the week of the Clinical Congress of Surgeons; the Southern Anæsthetists meet with the Southern Medical Association, and the California Medical Association usually acts as host to the meetings of the Pacific Coast

Anæsthetists. In this way the message of anæsthesia is brought home to members of the most important medical and surgical organizations in at least five metropolitan centres every year. Also the conjunction of such organizations in their meetings provides papers of unusual excellence for the programmes and speakers of very high calibre. In covering so vast a territory anæsthesia is developed very broadly, and anæsthetists, no matter where located, have every opportunity to attend and profit by the progress that is being reported. In addition, they are given the opportunity to contribute the results of their own work.

The most recent advance in organization is represented by the Anæsthesia Research Society, originally only national, but now international in scope. This society would seem to have an interesting future. So far, during its brief existence, it has organized a Research Committee of the more important scientific and clinical investigators in the specialty; it has established its own journal (*Current Researches in Anaesthesia and Analgesia*); it has issued special monographs, and anticipates reviving a Year-Book of Anæsthesia and Analgesia, while at the same time it is finding funds for fostering research. Beginning with 1926, this society is sending its *Journal* to the libraries of every American and Canadian medical and dental school and society, as well as teaching hospitals, with the purpose of making the progress of anæsthesia available in as many places of reference as possible, especially for the generation of anæsthetists which will follow our own. Its Record Committee has developed a uniform anæsthesia chart, and is working on a student's chart for teaching purposes.

The activities of the Research Society have so intrigued pure science that its most noted devotees in the larger universities and laboratories find pleasure in attending the various meetings and presenting their latest investigations and results. This has enabled the society to provide very remarkable sessions of research papers, and has opened many laboratories for experimental demonstrations. This correlation of interests has brought the achievements of science into the operating room and has sent the clinical problems of anæsthesia back to the laboratory for solution. When time and place have permitted, the programmes of several of the Congresses of Anæsthetists have been equally divided between the usual sessions of papers and lecture demonstrations in laboratories of members of the Research Committee. These latter enable those in attendance to come up to date on the experimental advances in their specialty.

In fostering the fellowship of clinical anæsthesia with pure science, officers of the Associated Anæsthetists and Governors of the Research Society are accustomed to attend the holiday recess meetings of the Federated Societies of Experimental Biology, and it may be said, with pardonable pride, that anæsthesia is often the only specialty participating in these invaluable sessions. As an illustration, following this meeting in Nottingham many of those who are on the Clinic Tour Abroad will go

on to Stockholm in pleasurable anticipation of extending co-operative relations with the leaders of the International Congress of Physiologists.

TEACHING ANÆSTHESIA.

The fact that an older generation of anæsthetists may have lacked something of the laboratory development of present-day medicine does not prevent us from realizing that progress in anæsthesias has always rested on a foundation of clinical practice and experimental science, and in visioning the future we cannot but feel convinced that the coming generation of anæsthetists must have the resources of applied physics, mechanics, chemistry, biochemistry, pharmacology, and pathology as part of the basis of their future careers. Coupled with these, there must be also a well rounded out medical education in the essentials of general practice and of the specialty, and most particularly in the technical and clinical phases of anæsthesia. Such requirements are none too drastic. In fact, a correlation of basic subjects in terms of essential knowledge, in relation to future utility, is merely a common sense preparation of the medical student for clinical practice. When possible, it is always preferable to develop information and technique on experimental animals than on human beings—always remembering, however, that the practice of medicine is a humane art, and not a cold-blooded laboratory experiment.

For the future it is hoped and expected that all these intimate alliances with the basic and experimental sciences already mentioned will result in the preparation and publication of a loose-leaf textbook on anæsthesia—not for the student, but for the teacher. A textbook that will in resume exhaust the essential knowledge of the basic and applied sciences in relation to experimental and clinical anæsthesia, and which from time to time, will be revised to include current and valuable progress. With the consummation of such an arrangement as this anæsthesia could be very readily fitted into the present curriculum, and could be taught intelligently from the viewpoint of applied science in relation to the solution of clinical problems.

IDEAL OF SERVICE.

Behind this idea in teaching is an ideal of service. Medical education and organized anæsthesia cannot accomplish their larger purposes merely in securing a steady flow of housemen proficient enough to satisfy the demands of hospital anæsthesia service and ambitious enough to provide a limited source of recruits for maintaining and extending the ranks of the specialty. If the medical profession is ever to accomplish the broader possibilities of anæsthesia in relation to public service every physician must be qualified to give safely, pleasantly, and efficiently such anæsthesia as may be required in painless child-birth or minor surgery, whether in the home, industrial clinic, or office. Also a certain number of better trained and more competent anæsthetists are required

to go into this work in the hospitals of smaller towns, where more and more of the surgery of the future is going to be done. As such anæsthetists develop through years of practice, they may look forward to staff positions challenging in importance those of the anæsthetists who have elected to stay on in the teaching hospitals in the larger centres, and make anæsthesia a metropolitan career. It is understood that, as in the past, teaching hospitals must continue the policy of fostering the development of anæsthetists, who vie in calibre with the personnel of any other department.

Details of the plans for securing these three types of anæsthetists would necessarily differ according to the local conditions and circumstances. Suffice it to say that they are being secured in certain localities by the co-operation of those interested in accomplishing the ideals of service. The general practitioner anæsthetist is essential to fulfil the obligation of the profession toward the public demand for the universal relief of pain and suffering, whenever and wherever that is possible in medical practice. The clinical anæsthetist must be the internist of the surgical team, and be capable of standing shoulder to shoulder on common ground with his fellows in the College of Physicians. The teaching anæsthetist must be the liaison officer between the research laboratory of the medical school and the surgical department of the hospital. His is the alchemy of transmuting pure science into applied science and practice, for the benefit of all concerned—students, surgeons, patients, hospitals, and his own associates and work in the specialty.

Almost all hospitals of any pretension appreciate the value of expert anæsthesias, and on their staffs have specialists in this work. Opportunities have thus been afforded for the development of the art to a very high degree. The result is that the mortality under anæsthesia has been reduced to a minimum, and patients entering a hospital have for their comfort and safety the services of men of large experience and scientific training in the art of anæsthesia.

In considering the future of the teaching of anæsthesia one naturally takes a survey of its past history and present advancement, and the short period of time that has elapsed since the introduction of this subject in the curriculum of our teaching hospitals is amazing. When it is realized that only within the last twenty-five years have internes in our Canadian hospitals been taught anything of the art of anæsthesia, or that students have attended more than one lecture in this subject during their entire medical course, the growth in this specialty, as exemplified in the present system of anæsthesia in the Toronto General Hospital, would appear phenomenal. To-day there exists in this institution, which as affiliated with the University of Toronto, a department in anæsthesia consisting of a chief and eight assistants, all of whom are specialists in the art. This department is as distinct as that of surgery or medicine. The chief is a member of the Medical Advisory Board of the hospital, which is composed of the heads of the various departments. He is also

lecturer in anæsthesia in the Faculty of Medicine of the University of Toronto.

As a result of this organization in anæsthesia the student has the advantage of a complete course in every phase of anæsthesia. It is interesting to note here that the department of anæsthesia reaps the benefit of any laboratory experiments in the University of Toronto which may lead to greater safety in the sphere of anæsthesia. During the past year the professor of therapeutics and his assistants have been experimenting with ephedrine, in connection with blood pressure in anæsthesia, and spinal anæsthesia in particular, and it would appear that this drug has come into a new field of usefulness in raising and sustaining the blood pressure and stimulating the heart action.

But even with such progress we look forward to greater achievement, and feel that surely it is not too much to hope for the establishment in the near future of a Chair of Anæsthesia in every university where medicine is taught.

RECORDS AND SAFETY-FIRST.

Having for a time exalted perfection of technique above all else, discounted the laboratory and left the internist outside the hospital portals, surgery, in its fourth and physiological era, has sensed the necessity for essentials other than sublimated dexterity and intuitive infallibility. Anæsthesia anticipated this change in attitude, and the International Anæsthesia Research Society in developing its uniform Anæsthesia Record—which is a really safety-first campaign to prevent needless fatalities—stands ready to co-operate in bringing surgery from under the odium of the time-worn adage, "The operation was a success, but the patient died."

For the future, the patient's fate is not to be left to chance. Hence the Research Society's Record demands the following essentials:

1. Evaluation of surgical and anæsthetic risk before operation, to determine what preoperative therapy, preparation, and care will add to the prospects for a safer operative ordeal and a more assured recovery.
2. Five-minute blood pressure guides and safeguards during the entire operative period, to give accurate information to indicate that the patient is still in a zone of safety, or to anticipate the onset of shock and provide remedial measures in time to be effective and life-saving.
3. Evaluation of recovery indices after operation, to determine post-operative therapy and care that will reduce morbidity to a negligible minimum.

Simply as these essentials may be stated, they can be made to include all the resources of experimental and clinical progress in medical practice as adaptable to the preparation, protection, and recovery of operated patients; and the more intensively and routinely anæsthetists and surgical teams extend the use of these safety-first essentials and chart the treacherous course 'twixt life and death, the more gloriously will they

serve the interests of safer surgery, and the sooner will they secure the utter and complete confidence of suffering humanity. The "supposedly fit" will cease to pass away unexpectedly and without adequate explanation; the "gravest risks" will no longer be hurried into emergency operations without safeguarding preparation; and there will be no guess work about what is happening to the patient during the operative period. Finally, the critical seventy-two hours of post-operative anxiety, morbidity, and too frequent mortality, will give way to the blessing of a comfortable and uneventful recovery.

At the present time the Record Committee of the International Anæsthesia Research Society is working on the development of a Teaching Anæsthesia Chart that will enable students and internes to collate in detail the entire fund of their medical knowledge in terms of diagnostic and prognostic aid. This chart will make all pertinent data of the complete history, as well as the results of further indicated examinations and tests, available for exhaustive pre-operative evaluation, operative protection, and post-operative recovery. Time and experience will then show how such charting and evaluation may be simplified and concentrated without sacrificing anything that assures safety-first surgery and anæsthesia.

SOURCES OF PROGRESS.

It is readily to be seen, from the records of progress in the past decade, that the specialty of anæsthesia is prepared for future development. Research workers have enthusiastically discovered and perfected newer general and local anæsthetics; manufacturers have made them available in quantity and quality, and with proper equipment for widespread use; and anæsthetists and other specialists have given them rapid and thorough clinical trial. The end is not yet. We seem to stand on the threshold of a new era, in which the very mechanism of anæsthesia itself will be explained, and after that the possibilities of progress would seem to be limitless.

Nothing would seem to be more important to the future of anæsthesia than the co-operation of all concerned in securing supplies of anæsthetics that may be depended on for absolute and undeviating purity and potency. This holds true for the old anæsthetics, such as chloroform, ether, ethyl chlorid and nitrous oxid, as well as for the newer anæsthetics—acetylene, ethylene, and propylene. Strange as it may seem, in spite of all efforts at fool-proof production, packing and storage, anæsthetics still get into the operating room that now and again are open to the suspicion of contamination with impure or deteriorating by-products. It augurs well for the ultimate solution of this problem that a joint committee to investigate and act in these premises has been established by the British Medical Research Council and the Section of Anæsthetics of the Royal Society of Medicine. No precautions in commercial handling, hospital testing, and operating room use can be too rigid or

exhaustive in obviating the occasional disasters, seemingly due to unaccountable and all but inexplicable impurities in anæsthetics.

While connections that would in any way commercialize the specialty of anæsthesia or the practice of medicine as a whole could not be countenanced, it has remained for the University of Toronto to show the way in which a new clinical remedy (insulin), the product of intensive laboratory research, may be made available through commercial channels without prejudice and to the best interests of everyone. There would seem to be no good reason that newer anæsthetics should not be developed and made available according to the same ethical plan, and the royalties accruing from such, used for further research in anæsthesia.

Perhaps without realizing the full significance of what has been done, or its possibilities, anæsthesia has established two central exchanges—one in Manchester and the other in Avon Lake, Ohio. If any of you have had occasion to get in touch with either of these exchanges, to secure information or to be connected with someone who could give it to you, you will readily appreciate my inference that such exchanges and those who man them will play an important part in the future of anæsthesia. The specialty is fortunate in having the incumbents of these exchanges peculiarly qualified to carry on the editorial organization and executive duties that are involved.

Regarding the Manchester Exchange, it is splendidly manned by Dr. H. M. Cohen, assisted by Dr. S. R. Wilson, both of whom need no introduction to this Association. They are doing excellent work and receiving royal support from their fellow anæsthetists.

The "Little Father of Anæsthesia," in the United States and Canada to-day—Dr. Frank H. McMechan, who is the "Avon Lake Exchange"—has the heart-whole affection and devotion of each and all of us who know him. To him belongs the credit of the organization of the existing societies of anæsthetists in these two countries, and fostering activities of the International Anæsthesia Research Society. "The centre of every man's existence is a dream," and anæsthesia and its advancement have been his. His inspiration has come from "a clear vision of the eternal landscape of the past," and to him we owe our meeting here to-day—an achievement truly worthy of a Prometheus!

If other such exchanges can be established to serve as well as the existing two, we should have at least one such exchange in every country in which anæsthesia is recognized and practised as a specialty.

The present Clinic Tour in which all too few of the leaders of anæsthesia in the United States and Canada have found it possible to participate and meet their fellows in the specialty in Ireland, Scotland, and England, is a sequel to the visits of two of your representatives—Dr. H. E. G. Boyle and Dr. Z. Mennell—to our congresses. In extending and cementing the fellowship of anæsthesia in this personal way, may we not look forward to many joint meetings, as well as to the prospect that out of these associations of the present and past many

more may eventuate for the future, and out of them may be developed a College of Anæsthetists, international in scope and purpose? The founding of such a college would go far in raising the specialty of anæsthesia to its proper level, and the qualifications could be made exacting enough for membership to be a challenge of perfection in work and prestige of character.

THE PATIENT'S POINT OF VIEW.

In viewing the future of anæsthesia from the annals of the past, one realizes above all else the momentous changes due to scientific progress; but in this vision we must never for one moment forget that in this world of ours, from the dawn of history, one thing has remained in the very midst of its own wildest vagaries strangely immutable—human nature. For that reason the patient's point of view remains for the future, as it is in the present, and has been in the past, a paramount consideration. Just as the anæsthetists of each generation must be taught their work anew, so, too, the fathers and mothers, sisters and brothers of each generation must be reconvinced of the beneficence of the painless practice of medicine. When all is said and done, a successful profession, like a successful business, is based on the best possible service to the greatest number of people, and anæsthesia will thrive in direct proportion to its satisfied "customers." Physicians themselves are extremely exigent as patients. Bearing this in mind, we can easily fathom the patient's point of view by putting ourselves in his place and doing by him as we would be done by.

In conclusion, it seems to me that, as anæsthetists, our purposes, aspirations, and vision are encompassed in the motto of the Pacific Coast Association, "It is godlike to relieve pain," and that of the Canadian Society, "We safeguard those who sleep."

RUBBER DAM.—It is seldom necessary to tie rubber dam on to the anterior teeth. Australian made dam (Dunlop or Barnet Glass) will cling around the necks of the incisors so tightly that a considerable pull will be necessary to dislodge it at the end of the operation. This clinging property of the dam is best developed to the highest degree when the holes are the correct size, and the correct distance apart. The estimation of the correct size of the holes is a matter of experience, but their correct position may be accurately marked on the rubber by pressing it on the incisal edges of the teeth before using the perforator. The incisal edges of the teeth will make easily discernible marks on the surface of the rubber. A hole punched in the centre of the mark made by the incisal edge of a tooth will ensure the proper position of the rubber around the neck of that particular tooth.—*Dental Science Journal of Australia.*

Sunlight and Health

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STUDY of the importance of sunlight as a factor in the health of the community until recently has been sadly neglected. This neglect has not been due to any fault of the public health organizations, but rather to a lack of scientific investigation by the medical profession. Although from the time of Hippocrates physicians have observed, in a vague manner, the importance of light and fresh air in the treatment of disease, until 4 years ago no scientific proof had been noted of a definite effect of light on the metabolism of the body. Since then extensive investigations have been undertaken in United States, in Canada and elsewhere, which have yielded results of the greatest importance. It is now not only the duty but the privilege of our public health organizations to disseminate and apply this knowledge in a practical manner for the benefit of the people at large.

Before speaking of the importance of light in the growth, development and general metabolism of the body, we must first consider exactly what we mean by the term "light" or "light rays." Light is still generally regarded as a form of ether-wave energy, the character of which is dependent on the length of the wave. Sunlight, or, to use the correct term, solar radiation, is composed of invisible heat rays which have wave lengths longer than 760 millimicrons (a millimicron is one-millionth of a millimetre in length), visible light which varies in length from 760 to 380 millimicrons, and invisible ultra-violet rays which range from 380 to 290 millimicrons in length. Although strictly speaking the term light should be restricted to the visible rays, the term light or sunlight is here used as meaning the total solar radiation.

It was first shown some 50 years ago that sunlight retarded the growth of bacteria. Later it was observed that this action was not due to the heat of sunlight, or in other words to the infra-red rays, nor to the visible rays, with the exception of some of the shorter ones, but almost entirely to the ultra-violet rays. It was also observed that the shorter the ultra-violet ray the greater was this lethal effect on bacteria. It is obvious, on account of this action of sunlight, that it is of inestimable value to mankind from the hygienic standpoint. This is one effect of sunlight to which I wish to draw your attention.

Our knowledge of the effect of light on the growth, development and metabolism of the body has been gained largely through the study of one disease, namely, rickets. It is, therefore, necessary for us to consider this disease in some detail, not only on account of the importance of the

disease itself, but because its reaction to light gives us practically our only biologic test of the efficacy of different light rays. Rickets is a disease of infancy which occurs chiefly during the winter and spring months, and in distribution is confined almost entirely to the temperate zones. It involves not only the osseous system but also other parts of the body, particularly the nervous and muscular systems. The earliest manifestations of the disease are restlessness, sweating about the head, the development of soft areas at the back of the skull and enlargement of the junction of the bony and cartilaginous portion of the ribs, the so-called rachitic rosary. Later the muscles lose their tone and the long bones become soft, which results in the development of the well known bow-leg and knock-knee deformities. The blood is characterized by a marked reduction in the concentration of the inorganic phosphorus, and a slight reduction in the concentration of calcium. The most important change produced by rickets, however, and one which is usually overlooked, is a general lack of resistance of the individual to infection. This is by far the most important result of the disease.

Rickets can be cured or prevented by the administration in the food of the so-called antirachitic vitamin which is present in large quantities in raw cod liver oil. The chemical composition of this vitamin is unknown. The beneficial effect can be accurately followed by the appearance of characteristic bone changes readily shown by x-ray examination, and by an increase in the concentration of the inorganic phosphorus of the blood. Rickets can also be cured or prevented by the exposure of the individual to ultra-violet rays.

The effect of ultra-violet rays on rickets was first observed about 7 years ago in Germany. The criterion of cure was the appearance of the characteristic bone changes as shown by the x-ray. No studies were made of the effect of light on the metabolism of the body, however, until 4 years ago, when it was shown almost simultaneously at New York, at Johns Hopkins and at Toronto, that ultra-violet rays produce in infants with rickets a marked increase in the inorganic phosphorus content of the blood. It is indeed remarkable, in view of the fact that sunlight is the source of energy on this planet, that this change in the phosphorus metabolism is the first undisputed effect of sunlight on the human organism which has ever been observed.

THE SHORTEST RAYS THE MOST ESSENTIAL.

The shortest ultra-violet rays in the sunlight which reach the surface of the earth are 291 millimicrons in length, all rays shorter than this being absorbed by the layer of ozone in the outer limits of our atmosphere. This means that the ultra-violet rays of sunlight extend from 380 to 291 millimicrons in length. All these rays, however, are not equally effective from the metabolic standpoint. It has been shown, largely by the work of a New York investigator, that the effective rays are of a shorter wave length than 313 millimicrons. Therefore the

rays in sunlight which are most essential for the well-being of the human organism range only from 313 to 291 millimicrons in length and constitute less than 1 per cent. of the total solar radiation.

There are a number of factors which influence the percentage of essential ultra-violet rays which reach us. One of the properties of these rays is that they possess very little power of penetration and the shorter the wave length the more readily is the ray absorbed. The shorter rays, which are the most essential ones, are readily cut off by the smoke dust and the moisture in the air. One need only note the amount of smoke which hangs over all our large cities to realize what an important factor this is. Unfortunately no statistics for American cities are available, but in the city of London, England, as compared with the country of England, and as compared with the Swiss Alps, the highest daily percentage of ultra-violet rays was found to be in the proportion of 6 to 23 to 41. In other words the smoke dust and moisture in the air of London, compared with the Swiss Alps, cut off over 85 per cent. of the rays which are so essential to mankind. In Toronto we have so realized the importance of this factor that we are building a half-million dollar addition to our Hospital for Sick Children, in the form of a convalescent home, situated twelve miles outside the city.

The height of the sun in the sky is another factor which influences the percentage of ultra-violet rays which reach us. It is quite obvious that when the sun is low the rays pass through a greater distance of our atmosphere, and in this way a larger proportion are removed. We find that the percentage of ultra-violet rays in the early morning or late afternoon sunlight is practically negligible. Also in the winter, in the temperate zone, the sun is so low that the percentage of ultra-violet rays even at midday is very small. Actual measurements show that in the northern part of the United States and the southern part of Canada only about one-tenth of the ultra-violet radiation is found in the noonday sunlight of January as compared with that of July. The importance of this reduction of ultra-violet radiation may be even greater than the figures indicate, as the shortest and, therefore, the most effective rays are those diminished the most.

GLASS AND CLOTHING IMPENETRABLE.

The prevalence of the use of glass in our modern life must be considered in this question of ultra-violet radiation. Ordinary window glass stops all rays shorter than 330 millimicrons in length. Although the light, which has passed through glass, is of the greatest importance from the standpoint of vision, and retains all the appearance of ordinary sunlight, it contains none of the potent ultra-violet rays. This fact cannot be too strongly emphasized because so few people realize that light which has passed through ordinary glass has been robbed of practically all the rays which are essential for health.

The last important factor to be considered is the effect of clothes. Ultra-violet rays cannot penetrate ordinary clothing. Even an open mesh removes over 50 per cent of these rays. It is evident that to be effective the ultra-violet rays must fall on the unprotected skin.

We may conclude from all these facts that the effectiveness of solar ultra-violet radiation is dependent on:

1. The clearness of the atmosphere;
2. The height of the sun in the sky, which is in turn dependent on the time of day and the season of the year;
3. The absence of glass between the individual and the source of sunlight;
4. The amount of the body directly exposed to the rays of the sun.

THE ANTIRACHITIC VITAMIN.

We have stated that rickets can be cured or prevented by two means, first the administration of the antirachitic vitamin and second by the exposure of the individual to ultra-violet rays. At first glance these curative agents appear to have no connection with each other, but recent experiments reported simultaneously from Wisconsin and New York have shown that their action is the result of a common factor. It was found that exposure of different food substances to ultra-violet rays resulted in the production in the food of some substance which possessed the same properties as the antirachitic vitamin. There is no doubt that this substance actually is the antirachitic vitamin itself. It was soon found, however, that in order to produce the vitamin it was necessary for the irradiated substance to contain either cholesterol, an essential constituent of animal cells, or phytosterol, the corresponding plant constituent. In other words, the antirachitic vitamin may be produced by exposure of cholesterol or phytosterol to ultra-violet rays. What chemical change is produced in these substances is unknown. We can make the antirachitic vitamin but we still do not know its composition.

We have to go but one step further to link up the common effect of ultra-violet rays and the antirachitic vitamin. Cholesterol in inert foods can be so changed by exposure to ultra-violet rays that the antirachitic vitamin is actually produced. There is ample proof that cholesterol in the living body is activated in the same manner. Observations have been made that milk from irradiated cows and eggs from irradiated hens contain more antirachitic vitamin than when the animals or birds have not been exposed to ultra-violet rays. Another suggestive fact is that the part of the body exposed to ultra-violet rays, the skin, has a very high cholesterol content. We may conclude, therefore, that the ultra-violet rays of sunlight produce in the skin the antirachitic vitamin which is carried by the blood throughout the different organs to exert in some manner a vital influence on the metabolism of the body.

CHOLESTEROL IN COD LIVER OIL.

The antirachitic vitamin of cod liver oil owes its efficacy to the ultra-violet rays of sunlight. The sea contains a great deal of vegetable matter, and as water is comparatively permeable to ultra-violet rays, a large quantity of this matter no doubt contains activated phytosterol. Small fish eat this vegetable matter and change the phytosterol into cholesterol. The cod then eat these small fish and store the activated cholesterol in their livers from which it is extracted in the manufacture of cod liver oil.

SUNLIGHT SUPERIOR TO COD LIVER OIL.

If the antirachitic vitamin and ultra-violet rays produce the same effect in infants and children are the ultra-violet rays necessary? Can they not be entirely replaced by cod liver oil? I think not. One reason is that the amount of cod liver oil which can be assimilated without the production of a gastro-intestinal disturbance is limited. Although immeasurable benefits are obtained by the routine administration of 1 to 2 drams of cod liver oil 3 times a day to infants and children throughout the winter, the beneficial effect of summer sunlight is much greater. It is just possible that if the same amount of the antirachitic vitamin could be given in cod liver oil as is produced in the skin by the ultra-violet rays the effect might be the same. On the other hand, it is not positively known whether ultra-violet radiation does not increase the resistance of the individual regardless of the production of vitamin. It is very difficult to come to a definite conclusion, as other factors must also be considered, such as the greater amount of fresh air and exercise which children obtain in the summer. Also there is considerable indirect evidence that the visible and infra-red or heat waves of sunlight produce a beneficial effect on the body. In view of these facts, it is reasonable to consider that although the antirachitic vitamin can produce the same vital effect on the metabolism of the body as is produced by some of the ultra-violet rays of sunlight, nevertheless sunlight, if not absolutely essential for life, is of the greatest importance.

Another question which may be legitimately raised is whether we get too much ultra-violet radiation in sunlight. Pigmentation or tanning of the skin which is produced largely by the ultra-violet rays act as a protective measure. In the tropics it is well known that prolonged exposure to sunlight produces deleterious effects, but it has been shown that this is the result of the heat rays and not the ultra-violet rays. From the evidence at hand it is extremely doubtful that we can get too much ultra-violet radiation in sunlight.

DISSEMINATING INFORMATION.

All mothers should be told of the importance of sunlight as a factor in the production of healthy infants and children. The difference

between sunlight and fresh air must be clearly explained, as comparatively few mothers will follow instructions unless this is done. They will put their children out each day on the verandah or in the yard *but carefully protected from the direct sunlight*. We have found that the best results are obtained by telling mothers that they must get their children sunburnt. The objection will be raised that sunlight will hurt the baby's eyes. This is a tradition that has been handed down from generation to generation. In strong light infants close their eyelids, which cuts off all the ultra-violet rays and most of the visible and heat rays. In Toronto we have exposed patients daily to sunlight for periods as long as 4 hours and have never observed any ill effects on the eyes.

In the winter it is practically impossible to expose more than just the face of the infant. As ordinary window glass cuts off all the vital rays, it is useless to place the patient before a closed window. Certain American, English and German glass works have been experimenting in the manufacture of glass which will transmit these rays. It is expected that this type of glass will soon be on the market at a reasonable price.

Whenever possible, even in the middle of the winter, the infant should be taken out on bright days for a time between the hours of 11 A.M. and 2 P.M. and the sun allowed to shine directly on its face. By April definite sun baths may be given. The infant should be protected from the wind, but the bonnet should be pushed well back to expose as much of the face and forehead as possible. It is advisable to turn the baby slightly on one side so that it may open its eyes without looking directly into the sun. Ten or 15 minutes is quite long enough for the first sun bath, as the skin of the infant burns very readily. The duration should be increased about 5 minutes daily until exposure to the direct sunlight lasts 1 hour in the morning and 1 hour in the afternoon. As soon as possible the hands, the arms and legs should be exposed. In the hot summer days the head should be protected from the heat rays, and on very hot days it is advisable to give the sun bath between 9 and 10.30 A.M. If these instructions are carefully carried out a surprising degree of tanning will be obtained as early as the first of April. The amount of tanning or sunburn may be taken as a rough estimate of the effectiveness of the treatment.

So far the value of sunlight, from the pediatric standpoint only, has been considered, but the beneficial effects are not limited to infants and children. Rickets practically does not occur in adults, but there is no doubt that ultra-violet rays are intimately concerned with the vital processes of the adult organism. As has been stated, the great mortality in rachitic infants is due not to the bone changes but to the marked lowering of the resistance to infection. These infants die of broncho-pneumonia and other similar conditions, and constitute our greatest mortality during the winter and spring months. There is no doubt that ultra-violet rays increase the resistance to infection of the adult as well as the infant and child. Experiments undertaken in

England in which blood was removed from adults before and after exposure to ultra-violet rays show a marked increase in the bactericidal power of the blood after the individual had been exposed to the rays. The blood platelets, which are now considered to be connected in some way with the resistance of the individual, were also increased in number. These experiments constitute a direct proof that ultra-violet rays can increase the resistance of patients against infection.

There is no doubt that the whole population of our communities suffer from a lack of ultra-violet radiation during the winter months. As a result of this there is an increasing lack of resistance to disease, which results in the production during the late winter months of our greatest mortality rate of the year.

It is beyond the scope of this paper to consider other specific effects of ultra-violet radiation, as in the treatment of bone tuberculosis or the various skin diseases. The subject of artificial ultra-violet rays from the mercury vapour quartz lamp has not been considered, as it is very unlikely that these lamps will ever be of general use from the public health standpoint on account of their expense. A discussion of the value of artificial ultra-violet radiation would constitute a separate address. The mercury vapour quartz lamp has not only its advantages but its disadvantages, and it is not out of place to issue here a word of caution against its present-day indiscriminate use in the treatment of almost every known pathological condition. This in time will minimize its real value and bring discredit to the medical profession.

CONCLUSION.

Sunlight is essential to life. The rays which apparently are the most essential are the shortest invisible rays. They constitute less than 1 per cent. of the total solar radiation. They are readily absorbed by the smoke, dust and moisture of our atmosphere, and on this account are markedly diminished in our cities. They are also diminished in the winter and in the early morning and late afternoon, due to the sun being lower in the sky and the rays consequently passing through a greater distance of our atmosphere. They are absolutely cut off by glass and clothes. These rays apparently act on a substance in the skin known as cholesterol and produce what was formerly known as the antirachitic vitamin. This is carried by the blood to the various organs and produces a vital effect on the metabolism of the body. No doubt many changes are produced, but the ones we have definitely been able to measure are an increase in the calcium and phosphorus in the blood (the cure of rickets), an increase in the blood platelets, and an increase in the resistance of the individual to infection. If a knowledge of these facts can be disseminated throughout our communities, and applied by the people particularly during the late winter and spring months, it will result in a marked reduction in the incidence of disease and also will be the means of saving thousands of lives.

An Attempt at Standardization of the Root Canal Problem

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N presenting the subject matter of this paper, we feel that its purpose could better be served in a joint effort, than by three short individual papers, with the unavoidable repetition, minor points of controversy and lack of consecutive reasoning and presentation.

CANAL PROBLEM.

We feel that the most important part of the root canal problem lies in the proper diagnosis. Diagnosis is derived from the Greek, *dia*—meaning through, apart, between, across or asunder; and *gnosis*—meaning knowledge. Therefore diagnosis is the act of distinguishing one disease from another, or the determination of the nature of a case by means of distinctive marks or characteristics. An intimate study of all great men or women will reveal the fact that they have been successful diagnosticians.

In no other problem is it more important to get to the bottom of things, to recognize conditions, to find their causes, and through logical reasoning to deduce the effect or result of our treatments on these conditions. If conditions are such that diagnosis cannot be made, treatment should be delayed until such time as definite symptoms arise.

(1) *Diagnosis**

(a) History of patient.

General health learned by inquiry.

Temperature, pulse, respiration and blood pressure are important.

Inquiry as to joint conditions is an aid.

Inquiry into dietary habits is important, since this plays a large part in the health of supporting structures.

If bad dietary habits are found, advise diet along ideal lines which include a sufficient amount of dairy products (milk, butter, etc.); vegetables (lettuce, spinach, cabbage, etc.); fruits of all kinds; not too much meat, white bread or sugars; plenty of fibrous substances to stimulate mastication; plenty of water, preferably between meals.

Present health by observation.

Note the carriage, bearing and physical appearance, complexion, eyes and manner of speech.

Previous root canal treatment by inquiry,—success or failure of past treatments.

* Reference—Dr. McGehee.

Previous history of tooth in question,—by inquiry as regards soreness, swelling, etc.

(b) Clinical findings.

General tone of supporting structures—

Note the colour and condition of the membrane of lips, cheeks and gums, appearance of the tongue for coating fur, etc.

Deposits about the teeth, serumal and salivary calculus.

Presence of fistulas.

Presence of pockets.

Personal care of the mouth,—general hygiene.

General condition of the tooth in question as regards present caries, extensive fillings, extrusion, tenderness, excessive recession of the adjacent gingiva.

(c) Diagnostic aids.

Clinical manifestations are probably largely due to pathological disturbance taking place in the vessels, vasomotor and sensory nerves.

As a result of irritation of one sort or another, the vasomotor nerves supplying the walls of the vessels are probably first stimulated, then over-stimulated and finally paralyzed. This leads to arterial and venous hyperemia with resultant dilation of the vessel walls and pressure on the sensory nerves causing pain.

As the condition progresses, stagnation of the blood current results from pressure at the apex, (strangulation).

Progressive degenerative changes occur in vessels and nerves and we get a condition of inflammation fully established.

If suppurative changes occur, the pressure of the gases so formed are productive of pain so long as any vitality remains in the sensory fibre of the pulp.

The terminal nerves of the pulp are not supplied with tactile endings, hence the organ has no sense of location, and in early stages, frequently the pain is of a reflex nature, indefinitely located and referred to an adjacent tooth or to distant parts.

Percussion is an important aid, although often abused. Blow should be of a minimum uniform weight and a control test first carried out on corresponding teeth on opposite side, noting sound and reflex.

In early stage a reflex may only be obtained the first time and should be carefully noted.

TRANSILLUMINATION.

A tooth with a vital pulp will appear translucent and pinky, while one with a non-vital pulp appears opaque and often clouded to a grayish colour.

Discoloration and darkening are characteristic of non-vital teeth, though these phenomena are often absent.

THERMAL REACTION.

Pulps are peculiarly susceptible to changes of temperature on account of high vascularity, since it is known that application of cold causes contraction and application of heat causes expansion of tissues with a rich blood supply.

Prolonged application of ice or ethyl-chloride will elicit no response from a non-vital tooth.

Application of a hot ball burnisher or hot plug of gutta percha will bring no response in a non-vital tooth.

ELECTRICAL REACTION.

Application of a mild electric current will produce a response from a vital pulp, while none will be obtained from a non-vital pulp.

Find the "irritation point" on several known vital teeth (without fillings, if possible) by applying the pulp tester and gradually increasing the current until a tingling (not painful) sensation is felt.

After obtaining this irritation point, the following reaction will be of value in determining the probable physiological or pathological state of the tooth:

(a) A normal tooth will respond to the current at the "irritation point."

(b) An irritated tooth will respond to the current just below the irritation point.

(c) An inflamed pulp will respond to the current below the irritation point, the greater the inflammation the more ready the response.

(d) A suppurative pulp will respond to the current above the irritation point, the more suppurative the condition the less the response.

(e) A non-vital pulp will give no response to the full strength of the pulp tester.

X-RAYS.

The use of the x-ray is most valuable as a diagnostic measure and should be resorted to at the beginning of all cases where root canal treatment is to be attempted.

On a normal tooth the periodontal membrane may be seen as a continuous radiolucent line encircling the root; surrounding this will be noted the lamina dura, exhibited in the form of a radiopaque line. The trabeculae of the bone at the apex and outside this line should appear homogeneous with the surrounding bone.

In a radiograph to be of diagnostic value it should be possible to trace the pericementum and lamina dura entirely over the apex, to make

out the cellular structure, in cancellous bone, and to identify enamel, secondary dentine and root canal detail.

Any film in which these lines and structures cannot be traced distinctly is worthless for diagnosis, however brilliant or contrasting it may be as a photograph.

In some instances the apical space surrounding teeth recently infected may appear healthy in the x-ray, while teeth suffering from the effects of traumatic occlusion may exhibit an apparent rarefying or condensing process simulating infection, while still others may have an abnormally large apical space.

Many errors may be made from an imperfect understanding of this fact, hence, it will be seen that the x-ray is not infallible.

No one of these tests alone is infallible, but a combination and correlation of the individual findings will give a diagnosis with a very high degree of accuracy.

(2) *Classification of Patient.*

(a) Young, healthy.

(b) Elderly, healthy.

(c) Systemic weakness.

Specific disease of any kind, cardiac, renal, splenic and respiratory weaknesses.

(d) Peculiar susceptibilities.

(e) Temporary disabilities.

Coryza, pregnancy, any temporary lowering of vitality.

In these cases delay treatment until the patient has recovered. It is important to maintain the vitality of the pulp in every instance where possible.

The habit of ruthless destruction of pulps to aid in artificial restorations cannot be too strongly condemned.

However, the removal of the pulp does not necessarily result in leaving in position in the mouth a dead organ, since vital relationships are still maintained by way of the periodontal membrane.

A non-vital tooth is not then a menace in itself to the individual, if it be given proper treatment by thorough removal of all septic material and if the canals are hermetically sealed against the entrance of infection from without, or through the apical foramen.

It is true that the vital resistance of the tooth as regards enamel and dentine is disturbed, and it is more subject to caries, fracture, and other pathological disturbances than is a vital tooth. Yet even so, it is usually far superior to any artificial substitute.

CLASSIFICATION.

It is to be understood that the prognosis in the following classes is for a class A patient.

Class 1.

Healthy sterile pulps intentionally or accidentally exposed.

Prognosis very good.

Any method which maintains sterility, prevents hemorrhage, avoids air imprisonment, avoids pressure inserting root fillings and completely fills the canal, invites success.

In case of amputation of vital pulps, ease of manipulation is more important than the point of amputation.

In the case of sterile pulps with pulp stones, prognosis depends on location of stones and mechanical difficulties encountered; x-ray is specific aid in diagnosis. Treatment similar to sterile healthy pulp after removal of pulp stones.

Class 2.

Suppurative pulps with apical portion alive and no apparent peri-apical involvement.

Prognosis fair to good.

Most important to take time and not attempt to rush this type of case.

Remove decomposed tissue as far as possible, sterilize roughly without pressure, relieve congestion by hemorrhage, establish partial circulation if possible, and seal in soothing antiseptic dressing without pressure.

Later remove live portions of pulp with local anæsthetic, sterilize and fill canal.

Class 3.

Septic pulps with apical involvement.

(a) General infiltration. (Sunburnt effect in x-ray)

Prognosis very poor.

Treatment extraction.

(b) Sacculated or definitely circumscribed alveolar areas.

1. Apical attachment only.

Prognosis good.

Treatment—Mechanically cleanse canal to apex.

By chemical or electrolytic medication sterilize canal and apical area.

Fill canal.

2. Apical attachment with lateral involvement.

Prognosis very poor.

Treatment—advise extraction.

(c) Alveolar areas.

1. Chronic with fistula.

Prognosis fair.

Treatment—Irrigate fistula, establish drainage mechanically, cleanse canal and establish sterility. Fill canal.

2. Acute abscess.

Prognosis fair.

Treatment—Prescribe Dovers Powder on retiring and saline cathartic an hour before breakfast.

Establish drainage through canal and lance over apex if practical.

Proceed as in C 1.

(d) Previously filled canals with apical areas.

Prognosis poor, depending on possibility of removing old filling thoroughly.

Treatment—Remove filling completely and treat as previously.

Class 4.

Septic pulps caused by apical involvement in area of an adjacent tooth. (Strangulation)

Prognosis good.

Treatment—as in Class 2.

Electric vitality tests in these cases are invaluable. Also x-ray from two divergent angles.

Very often, after thorough treatment of a tooth with fistula, if the fistula breaks out again within six weeks, the trouble will be found in the adjacent tooth of this class.

Anterior teeth with straight, well developed roots offer the best prognosis, while molars, owing to mechanical difficulties involved, offer poorest chance of success.

In cases of undeveloped roots (children) use every effort to maintain apical vitality until full development has been attained.

Deciduous teeth are not considered a root canal problem, in a general sense, due to temporary retention.

Special cases for extraction.

Radicular cysts indicate immediate extraction and radical curettement of the lining membrane.

Teeth with abscess conditions involving the antrum should be extracted.

Teeth with malformed and inaccessible roots should be extracted.

Advanced age. General ill health, the presence of metabolic disturbance and symptoms of disease from focal infection, should preclude any attempts at root therapy upon any teeth with infected apical areas.

The presence of excessive periodontal disease or root resorption indicates extraction.

In any case where it is decided to attempt root therapy, the condition and possibility of future complications should be thoroughly explained to the patient and the responsibility should be assumed by patient and operator alike.

Fifty Years of Dental Progress

CHARLES RIPPON, L.D.S., R.C.S.IREL.



It was my good fortune to begin my life's work in dentistry in the year 1876, when there were great advantages in witnessing and taking part in the old order of things, and being able at once to appreciate and participate in the reformation that came within the next few years; of seeing the birth and growth of the science of bacteriology, of antiseptic and aseptic surgery, the discovery of the Roentgen rays and the growth of the science of radiology, of ionic medication and violet and ultra-violet radiation; the electric cautery, the introduction of the dental engine, rubber dam, the treatment of the dental pulp and the filling of root-canals, the induction of anæsthesia by the use of nitrous oxide and oxygen, nitrous oxide and ethyl chloride, and the long train of local anæsthetics that followed in rapid succession.

Those of you who have given any thought to the historical evolution of dental practice cannot fail to be profoundly impressed with the fundamental changes that have taken place in the comparatively short period since dentistry assumed the character of an organized profession. These changes have been so radical as to have completely revolutionized dental practice, a result that has not infrequently aroused some misgivings and some heart-burnings upon the part of the Old School, who believe they know what good dentistry is, and who, because of the altered conditions and changed technique, are wondering if their present-day colleagues are keeping the faith of their fathers and fulfilling, as they should, the obligations that the highest dental ideals impose.

I have often heard it contended that better dentistry was done in the past than now. The question involves a comparison of the dental ideals and achievements of the past, with those of the present.

What was the prevailing concept of dentistry in the past, and what are the changes which have been wrought in our mental attitude, whereby the dentistry of to-day has undergone a change so profound as to render it almost unrecognizable to those of an earlier generation? The answer is not far to seek. The dominating ideal of dentistry of the past was mechanical and artistic, an ideal that has been supplanted by the gradual, persistent and inevitable force of the biological factor as the element of primary importance in the dentistry of to-day. This fundamental alteration in point of view has brought about changes that affect not only dental art, but broadly speaking, every phase of practice. Let us consider an instance of the persistence of the biological factor in its modifying effect upon an important field of operative dentistry.

Until the results of Miller's researches were given to the world, little was known of the factors that determined the difference between areas

of susceptibility, and relative immunity of the various tooth surfaces to carious attack. Up to this time the generally accepted theory of the causes of caries held it to be an inflammatory disorder set up by the lateral pressure of contiguous teeth, the inflammatory foci at the point of approximal contact, leading to gangrene and dissolution of the affected areas, with the formation of cavities. The logical deduction from this erroneous hypothesis was obviously that relief of lateral pressure would prevent the disease, or arrest it when established. The treatment consisted in the free use of the separating file between all teeth, so that a silk thread would pass to the gum without restraint. This separating idea received a further impetus by the persistent contention that caries could be prevented by an intelligent reshaping of the approximal surfaces of the teeth, so as to render them incapable of retaining food debris, that is to say, self-cleansing. This domination of the separation idea resulted in the destruction and loss of countless numbers of human teeth, and was without effect either in preventing or arresting the progress of caries. What it did was to transfer the area of greatest resistance to the most susceptible, the gingival margin, by inviting the impaction of food interproximally, and finally, a septic condition of the tissues, alveolar destruction and loss of teeth.

In time, these devastating results gave rise to a reaction against the separating theory, and the dawn of a new conception as to the functional importance of the form of the approximal surfaces, and the protective character of their approximal contacts. That approximal contact is a condition upon which ultimately depends the salvation of the tooth as a masticating organ, became clear to the minds of a few men who were bold enough to advocate the restoration of full contour in all tooth-filling operations. In rapid succession the whole dental profession adopted the method of restoration of contour as the ideal in operative dental surgery.

My purpose in presenting this review of one of the outstanding features in the history of dental progress, is not so much to discuss historical data, as it is to direct your attention to the underlying factors that made the situation possible, and more particularly to emphasize the animating force that led to the correction of this stupendous error. Mentally blinded by the mechanical ideal which throughout that period exerted a controlling influence upon dental practice, few, if any, minds in dentistry were able to read and interpret the protests that the vital dental tissues were persistently recording against physical insults inflicted upon them by the separating file.

When it was realized that the inflammatory lesions of the retentive tissues, resulting in their loss, were the logical answer to that type of mechanical injury, even though inflicted in the name of prophylaxis and therapy, the revelation found its material application in the practice of restoration of tooth contour when lost by caries or otherwise.

The restoration of the contour of the approximal tooth surfaces has

taken us far beyond the mere consideration of the functional element; it has compelled a recognition of the functional relationships of each of the teeth in the dental arch individually, and of the dental arch as a whole. In no department in dental practice is this more evident than in orthodontia. Dr. Angle based the science of orthodontia upon correct occlusion, the means by which improvement in mastication and in personal appearance was to be attained. It came to be recognized that much more was being accomplished by the restoration of correct occlusion, than mere mechanical readjustment of the teeth to normal inter-relationship, and æsthetic improvement. We are compelled to recognize that correction of malocclusion has brought complete relief to a number of neuralgic and abnormal co-existent conditions of a local character associated with the mouth.

As I have already stated, the reaction against the treatment of approximal cavities by the separating file brought to light a correct conception of the protecting function of the form of the approximal surfaces, and their relation as a whole, not only to the retentive and supporting tissues, but also of the tooth itself, so in like manner the study of the function of mastication has progressively unfolded the conception that correct occlusion is dependent upon tooth form in its relations to the individual masticatory plane.

The introduction of the dental engine was a further mechanical aid to probe the unknown. The previously slow methods of cavity preparation by the hand bur, the crutch bur, and the Archimedean drill, gave place to the high-speed bur of the engine. The rapidity and ease by which tooth structure could be removed was a revelation, and quickly extended the field of cavity preparation, with the result that innumerable dental pulps were exposed, resulting in their ultimate infection and loss.

It is also interesting to note from this time onward the rapid improvement in cutting instruments; every conceivable shape and angle were to hand; in fact, every possible mechanical aid to cut away tooth structure was invented, in a sense tending to assist in pulp infection.

The general science of medicine and dentistry at this period did not realize the important role that teeth played in the health of the individual; dental caries was considered to be an uncomfortable or painful condition, but by no means serious. Alveolar abscess was fomented, poulticed, or incised and allowed to become chronic; a number of sinuses on the gum caused no comment. Glandular enlargements had nothing whatever to do with teeth. An inch of ulceration elsewhere on the body, which did not heal in a few weeks, caused some anxiety, but 3 in. of chronic ulceration around the gum margin was of no account; "oral sepsis" was unknown.

In medicine, as in dental surgery, many crude methods of treatment were introduced which promised unbounded success. Although many of these remedies were founded upon a working hypothesis, they were without principle and consequently not permanent. They went a certain

distance with success, and only gradually were their weaknesses perceived. They were not so much wrong as incomplete. As far as they went they were good, and as an intermediate step were helpful and stimulating. There is always some justification for any action which is progressive and well intended, however mistaken it may be. It is part of our training to be able to make our way among pitfalls and obstacles, to make progress slowly and with difficulty, and gradually to learn what is true by finding out what is false; never learning the whole truth but making towards it in a blundering but persevering manner.

It was research on these lines which summoned the great Pasteur from chemistry to biology, to lay the foundation for his theory of disease, and it was the noble work of Lister to apply it with such beneficent results to surgery. To the great Frenchman, Pasteur, we owe the foundation of the science of bacteriology, the nature of fermentation and the life manifestations of micro-organisms, the principles upon which all modern treatment of disease is based. To the equally great Englishman, Lister, we owe the application of his discovery of antiseptics, which has probably been of greater benefit to mankind than any discovery in the history of progressive science.

With the dawn of the science of bacteriology and the co-ordination of allied sciences following on the investigations of Pasteur, Lister, Tyndall, Koch, and Miller, there has been a rapid advancement in dental literature; our technique has been modified and new ideals created, which serve not only to explain the view of those who fear that the dentistry of the past was better than the dentistry of to-day, but will also bring the comforting assurance that it is quite the reverse; for the dentistry of to-day, while demanding, as it does, a preparatory training not only in the elementary physical sciences and professional technique, is placing more and more emphasis upon biology and the limitations which the reactions of the living organisms with which we deal, impose upon our ministrations. It has compelled us to realize in a very practical way that the masticatory organs are not a machine, but organs possessing such sensitive and responsive vital tissues that, quite apart from their masticatory function, they involve relationships not only of bodily well-being but of life itself.—*The British Dental Journal*.

REMOVAL OF DRUG STAINS.—Drug stains on the hands and linen are said to be removed as follows:

Iodine—The stains disappear on moistening with ammonia or sodium thio-sulphate.

Silver Nitrate—These stains may be removed with potassium cyanide solution, or, with less danger, with concentrated potassium iodide solution. The yellow silver iodide formed in the latter case must be removed by means of a sodium thio-sulphate solution. A solution of mercuric chloride and ammonium chloride, of each 10 gm. dissolved in 80 cc. water, has also been recommended.

A Pioneer of New Health: Hippocrates

SIR W. ARBUTHNOT LANE, BART., C.B.

[Hippocrates is no less the Father of Dentistry than he is the Father of Medicine, for he had the vision to see the relationship between the teeth and health, and practised both of these branches of the healing art. Hippocrates also wrote several treatises upon dental disease and the care of the teeth.—EDITOR.]



IPPOCRATES, the Father of Medicine, lived 23 centuries ago. He possessed none of the scientific instruments which we possess now. He had no thermometer with which to measure a man's temperature, nor a watch to count his pulse. However, he had a wonderful power of observation, wisdom, vision, and common sense. He was not the physician of the laboratory, but the physician of observation, of bedside experience.

Hippocrates recognized that prevention is better than cure. Although he was an excellent surgeon and was well acquainted with many medicines which are still employed, he attached by far the greatest importance to right food, fresh air, cleanliness, exercise, free excretion and so forth. He wrote in his celebrated book, "Ancient Medicine":—

"Strength, growth and nourishment result from right food. It is necessary that every physician should be a skilled student of nature, and if he wishes to perform his duties properly he should strive to know the relation which exists between the health of men and the articles of food and drink which they consume, and the effect of the various occupations and pursuits upon the human body."

Hippocrates wrote in the plainest possible language, and he urged his successors that they should do likewise, stating: "Whoever treats of the art of healing without the capacity of making matters clear to the unlearned average reader, and fails to interest him in the subject, has missed his mark."

Hippocrates had faith unlimited in the healing power of nature, and wished to assist it by urging natural remedies in preference to artificial ones. Like the founders of the New Health Society, he attached the greatest value to bread, which, he considered, should indeed be the staff of life. A nation's health may be made or unmade by its cooks. Hippocrates wrote:—

"To the human body it makes a great difference whether the bread be made of fine flour or coarse, whether with the bran or without the bran, whether mixed with much water or little water, whether strongly kneaded or little kneaded, whether thoroughly baked or underdone—and a multitude of similar differences.

"Whoever pays no attention to these things, or who pays attention to them without full knowledge, cannot understand the diseases which befall man. By every one of these factors the health and condition of man are affected in some way, and his entire life is influenced thereby, whether he be in health, suffering from disease or convalescent. It follows that nothing else is more important or more necessary to know than these things."

Hippocrates was obviously in favour of the modern equivalent of wholemeal bread, which is a most excellent regulator of excretion. The ancient Greeks apparently did not suffer from the now universal complaint of abdominal torpor, for he stated casually in his book, "On Diseases," that men should have evacuations three or four times per day. However, he did not mean to urge people to rely upon medicines for the regulation of their bowels. He was strongly opposed to the taking of medicines for that purpose, for he wrote in his "Aphorisms":—

"Persons in good health quickly lose their strength by taking purgative medicines, or using bad food."

His "Aphorisms" consist in the main of short pithy sentences, of proverb-like character, which were probably intended to be learnt by heart by medical men, and perhaps by laymen as well. I would quote a few of these aphorisms:—

"When more food than is proper has been taken, it occasions disease."

"Neither repletion nor fasting, nor anything else, is good that is carried to excess."

"Bodies not properly cleansed, the more you nourish them the more you injure them."

"Articles of food or drink (for the sick) which are slightly inferior, but more palatable, are to be preferred to those which are better but less palatable!"

Although Hippocrates was wonderfully advanced in his ideas as to treatment by diet, abstinence, baths of every sort, fresh air, sunshine, exercise of various kinds, psychological treatment, etc., and although he laid the greatest stress upon these natural, safe, and sound measures, he was truly an eminent physician and surgeon. Many operations are done at this day in accordance with the recommendations of the Father of Medicine, and modern physicians may learn a great deal from the natural treatment which Hippocrates adopted wherever it was possible.

After all, most of our diseases spring from faulty feeding, lack of fresh air, etc., and many of them can best be cured by natural means. That is shown by the wonderful success of the open-air cure in tuberculosis of the lungs, etc.—*New Health*.

Montreal Dental Assistants' Association

HE DENTAL ASSISTANTS' ASSOCIATION of Montreal, Canada, held the first Clinic Class at McGill University on Monday, December 13th, 1926. Madame A. Guay presided, and the guest-speaker was Dr. George S. Cameron, Professor of Prosthetic Dentistry, McGill University, who spoke on the subject of "Chair Assistance," followed by a demonstration of practical work. Dr. Cameron gave a brief outline of the duties of dental assistants, stating that, without question, their services are indispensable in a modern office. The following address (in part) was given:—

CONCERNING THE DENTAL ASSISTANT.

It was with a great deal of diffidence that I accepted the invitation to appear before you this evening.

I have known for a very long time that if you wish to flatter a person, the most subtle way of doing so is to ask their advice.

I am here in the role of an advisor to-night, and feel sincerely flattered for the honour you have given to me, namely, to be asked to address you on this occasion.

It is rather a coincidence how I eventually became interested in your work along the lines you are now following, i.e., getting a Dental Assistants' Association under way. I cannot say that I was an enthusiast at the start, and when it became necessary to look into the question more fully, it was through reading some of the articles along this line, but when, eventually, I was loaned a copy of the notes taken by one of your members in her course at Toronto, I suddenly became aware of the importance of this movement.

I am before you to-night, not in the role of a person who has been dragged against his will in a half-hearted manner, but am now fully converted to your Association, and wish to impress on you that this is not a carefully prepared flowery statement. I say it with all sincerity—*I am an enthusiast.*

To-night I do not want you to think this meeting is a formal affair. I want each and every one to become just as enthusiastic as I am. The fact of your being here means that you are interested in your work, and are not afraid to devote some of your free time to improve what knowledge you already possess.

Let me say at the start that the aim of your society is to be of assistance to each and every member. Usually the talking is left to a few, and I know that in this society, like all others, some will attend and have problems which might be solved, but, through shyness, will not ask questions; or possibly will know a better way of doing a certain piece of work than the demonstrator has shown. In the first instance, the member has suffered a loss. In the second, we have. So now we

have the understanding that we are gathered together for each other's benefit.

The role that I play is getting the ball started, with the understanding that, as far as possible, we will all derive a certain amount of benefit from same.

Formerly, becoming a dental assistant happened more through accident than pre-arranged plans. The dentist was in need of someone to answer phone and door, also keep the suite tidy. The young girl who finally accepted such responsibilities was not particularly interested in the work, and, as a rule, was just putting in time until something better turned up. Time rolled on and she was still in the same place. Through this lack of interest her efficiency had not increased, and no future seemed in store for her.

Such are not the conditions to-day. The busy dentist is continually trying to study in what manner he can improve his practice, so that he can devote the most of his time to duties called productive. It is essential first and foremost that he should have expert assistance.

Several colleges have already realized this situation, and have added courses for the training of educated young ladies in order that they might be qualified to become expert dental assistants. Dental Assistants' Societies are being formed all over this Continent, where members will meet and discuss subjects pertaining to their work.

One cannot help but think that this new phase of our endeavours will be of great benefit to all concerned, which includes the workers and patients.

To be content, one must work with congenial people. It is just as important for the assistant to study her employer, and if, after a very careful survey of conditions, she finds that her efforts are not fully appreciated, my advice is to change.

A few essentials for a dental assistant: Pleasant appearance and manner; should take great pride in her uniforms; patients should be received in a courteous manner. Conversations over telephone are of great importance. Acquire talking in a low, well-modulated voice, and be careful not to raise same at end of sentence. See that the patients' cards are arranged properly for the day. Patients who for some reason or other have been overlooked, should be called up and new appointments made. All laboratory work should be ready at the appointed time. Inspect the suite in the morning, and note if everything is in shape for the day's work. The assistant assumes responsibility for the suite being in good condition.

The following story will illustrate what has happened:—A new lady patient, wearing white kid gloves, reaches for a magazine in the waiting room. Her gloves are covered with dust from same; she leaves immediately in a very indignant manner. One does not require much vision to imagine what free publicity that office received in due course.

In regard to instruments, the entire equipment should be gone over at

least once a week, using Bon-Ami, etc., and seeing these are kept in this condition. Handpieces require special care.

Know the workings of equipment, such as units, etc.; and the cabinet. Yes, the poor old cabinet, how it has been abused! One might almost call it the junk receptacle. Only what is essential should be kept in same. Have another place for surplus stock and instruments, which are seldom, if ever, used.

There are two types of dentists: First, those who prefer to do all the work themselves; second, those who are used to and require expert assistance.

For the first type, through tact and careful study, which to-day is being outlined by courses and societies, the assistant can make herself invaluable to the dentist without his knowledge of same, till he awakens up to the fact and fully realizes the position she holds in his every-day efforts.

The second type is different. He has had experience of expert assistance, will look around for same before he decides in taking on new assistants, and naturally will require someone not only with experience in dental offices, but a person who is *efficient*.

This talk to-night is somewhat similar to a prologue. Other talks will follow, and as far as possible I am not going to touch subjects which will be covered at a future date.

I am constantly trying to get the students to check themselves up by self-analysis and self-improvement. This would cover a complete lecture in itself.

You, in your work, hold positions of trust. I am happy to say that in my experience I have always been impressed with the fact that I have yet to meet an assistant who in any way has made intactful statements in regard to the office which she is employed in or has left.

I have yet to meet the "knocker" (using a slang expression) where they themselves were not nearly the whole cause of dissatisfaction.

Life is so short, and enough trials are encountered; so let the aim of each and every one be to be a *booster*, which will tend to make us all happier. In conclusion of this part of our talk, I would earnestly advise each and every one to get themselves the book *Practice Building Suggestions*.

Mussolini Decrees Wholemeal



IGNOR MUSSOLINI recently ordained by special decree the complete prohibition of the use of any kind of bread except that made from wholemeal. We had scarcely realized our propaganda had reached so far, or had gained influence in such august quarters as those of the Fascist Prime Minister. Deeming the occasion of the first importance to the New Health movement, our President sent to the Duce, through the courtesy of the Italian

Chargé d'Affaires in London, the following statement, which has just been widely published in the Italian Press:—

"Sir William Arbuthnot Lane, the President of the New Health Society, presents his compliments to His Excellency, the Duce, and desires to say with what keen pleasure the Council of the Society has heard of the Duce's decree establishing the sole use of wholemeal bread for his people, a course which the Society has striven to bring about in England for a long time with only partial success.

"Amongst the numerous benefits which His Excellency has conferred upon Italy, not the least will be this vital contribution to the health and happiness of the people. It is the chief part of the teaching of this Society, which is supported by the most important group of medical specialists and scientists ever assembled in this country for the welfare of the public, that pure food and wholemeal bread in particular form the very foundation of the health of the people, and that the consumption of impure food, and especially white bread, lies at the root of the greater part of the ill-health and disease that afflict the majority of civilized communities.

"The New Health Society therefore welcomes with the greatest gratitude the immense encouragement to its movement which the Duce's recent decree has affected, and we beg him to accept the very hearty congratulations of all our members, together with their best wishes for the long continuance of his noble services to the Italian people and to humanity."

In connection with this important decision on the part of Signor Mussolini, a member of the New Health Society witnessed a curious incident in an Italian restaurant. An American seated at the breakfast table was presented with a wholemeal roll. He spurned it and demanded the usual white roll. The waiter drew himself up and, with the elaborate Fascist salute, exclaimed in stern tones: "The Duce has decreed that wholemeal bread is the only bread to be eaten in Italy, and everything that the Duce does is for the benefit and happiness of the people."

"Improvement in the health and physique of the nation depends to a large extent upon the prevention of dental disease. This fact has recently been illustrated in the records of an approved society, which show a reduction of over 40 per cent. in the number of sickness claims for such ailments as anæmia, gastritis, dyspepsia, and chronic rheumatism since the institution of dental treatment for its members."—(SIR GEORGE NEWMAN in *"An Outline of the Practice of Preventive Medicine."*)

"As a rough guide to the amount of air space required in a dwelling-room, it may be said that for cottages from 30 to 40 square feet of floor space should be provided per person in the living-room, and from 60 to 70 in the sleeping-room. These, of course, are minimal areas, but they fit in approximately with the scientific principles on which ventilation is based."—(From *"The House of Health,"* by SIR JOHN ROBERTSON, Medical Officer of Health, Birmingham.)

Montreal Dental Club Commemoration Banquet, 1897-1927



BANQUET was held on Friday, January 21st, 1927, to commemorate the founding of the Club, in the office of the late Peter Brown, exactly thirty years ago.

The feature event of the meeting, which was held in the Mount Royal Hotel and attended by fifty members of the Club, was the election of four charter members to be honorary life members, viz.: Drs. W. G. Throsby, H. J. S. Nichol, T. D. Tansey and C. F. Morison. Their names were proposed by Geo. S. Cameron, President in 1908, and seconded by Wm. Watson, President in 1906. The health of the new honorary members was proposed by Dr. D. J. Berwick.

Entertainment, in the way of songs, piano solos and recitations, was contributed by Drs. Armitage, Cameron, R. Cleveland, Laurin, S. Nichol, and several other artists.

The list of subjects and speakers presented before the Club the first five years was read by a former Secretary, Dr. J. S. Dohan, and the list for the period 1921-1927, was read by the present Secretary, Dr. W. C. Bushell.

The arrangements, including providing for a mammoth birthday cake, were in the hands of Dr. J. C. Flanagan.

Dr. A. N. Jenks, President of the Club, presided.

THE CHAIRMAN'S ADDRESS.



GLOOMY DEAN INGE makes use of this phrase, "The liberty of prophesying." One wonders, to-night, how near the mark any of these honoured guests would have come had he exercised that liberty thirty years ago. For, on this very evening, thirty years ago, this little community of interests, the Montreal Dental Club, came into being.

One wonders if, on that distant night, those burden bearers, those founders of this Club, could have guessed a function of this sort. For this meeting represents a combined membership of nearly a hundred of the local dental profession. It is supported now, for the most part, by young fellows who are just sensing the acrid heat of battle, and who were not born one score and ten years ago, when this Club was founded in the little office of Peter Brown of honoured memory.

Between these poles the fortunes of this Club run in a human-like, undulating curve. Almost on the first meeting everybody agreed that a tremendous list of papers should be prepared by the members—the proposed subjects and the proposed speakers are set forth at considerable length in the ancient minutes. Alas, all proved to be myths according to the records. Shortly the annual meeting took the form of a banquet at the Hotel Carslake.

The health of the Queen was drunk, and a good time was had by all at the annual meeting in 1899 at the Place Viger.

Secretary Jack records the feeling of the members by saying, "A dinner meeting should be held monthly." Secretary Jack also notes "some remarks were passed on the cigars; evidently they were too domesticated for the majority of those present." The import of that record is lost in golden antiquity.

But, later in the same year, Secretary C. F. Morison has the melancholy task of spreading on the pages of the minutes this doleful tale, that owing to the poorly attended meetings there had been thought of abandoning the Club. Also, Dr. Gardner felt obliged to make this motion, that those in arrears for dues should be written to, which has a thoroughly modern ring. So it goes through the years, high spots and valleys, till the trying years of the Great War and its shaking aftermath have passed.

Secretary Morison records that Dr. Ives welcomed some of the younger members and hoped they would be regular at the meetings. Some of these younger members were Drs. Henry and Wilkinson.

Through the vicissitudes of this Club the name of one of our honorary members runs like a golden thread, as founder, supporter, counsellor, clinician, president, and now *doyen* of membership—Dr. F. Arnold Stevenson. His name appears in the minutes of nearly every meeting, over thirty years of continuous support.

LIST OF SUBJECTS AND SPEAKERS, 1897-1902.

"Bacteria"—Dr. Peter Brown.

"Is a business education not necessary to a professional as well as to a business man?"—Dr. J. G. Gardner, President.

"Pyorrhoea Alveolaris"—Dr. Giles.

"Dental Pulp"—Dr. Stevenson.

"The Dental Board"—Dr. Kerr.

"Copper Amalgam as a Filling Material"—Dr. Tansey.

"Transplantation, Replantation and Implantation"—Dr. J. Munroe.

"Disease of the Antrum"—Dr. A. Scott Ives.

"Oral Surgery"—Dr. C. F. Morison.

"Observations on Filling Teeth"—Dr. W. J. Kerr.

"Hydro Chloride of Orthoform Used for Removing Pulps"—Dr. Brown.
(Orthoform is a new drug, non-poisonous, sedative, relieving pain of exposed pulps.)

"The Comparative Merits of Gold and Amalgam as Filling Materials"—Dr. McGregor.

"Practical Points on Porcelain Work"—Dr. Oliver.
(Illustrated with models and appliances.)

"Dental Jurisprudence"—Dr. Jack.

"Bacteria" (Their action on the mouth)—Dr. Springle.

"Method of Inserting Gold Fillings"—Dr. Jack.

"Uses of Formalin Compound in Dentistry"—Dr. Springle.

"Pulp Capping and Pulp Canal Treatment"—as practised by Dr. W. J. Kennedy.

"Pyorrhoea Alveolaris"—Dr. Giles.

"Use of Sodium Dioxide as an Antiseptic Root Canal Treatment"—Dr. Shaw.

JOURNALS SUBSCRIBED TO IN 1899.

International.
Stomatological.
Items of Interest.
Ohio.

Record.
Ash's Quarterly.
British Journal of
Dental Science.

Journal of British
Dental Association.
Dental Review
(Chicago).

LIST OF SUBJECTS AND SPEAKERS, 1921-1926.

- "Silver Reduction Method for Filling and Treating Root Canals"—Dr. G. P. Howe, Boston.
- "Fixed Bridgework"—Dr. J. Kendall Burgess, New York City.
- "Mouth Infections in Relation to Syphilis"—Dr. Ralph E. Powell.
- "Inlay" Crown and Bridge Design"—Dr. I. H. Ante, Toronto.
- "Taking Impressions with Compound According to Dr. Hall's Method."
- "Steps following Impression Taking to Setting Up of Teeth on Dr. Hall's Articulator"—Dr. Ante, Toronto.
- "Prophylaxis, the Dentist and Specialist"—Dr. D. P. Mowry.
- "Gold Inlays, Modified Carmichael Attachments"—Dr. Clappison, Hamilton.
- "Root Canal Treatment"—Dr. F. H. A. Baxter.
- "Crown and Bridgework"—Dr. W. H. Elliott.
- "Diet"—Dr. Rabinovitch.
- "Common Tumors of the Mouth and Face"—Dr. Scrimger.
- Clinic and paper on "Full Denture Construction."
- Illustrated lecture on "Art and Aesthetics and Occlusion and Articulation," with an explanation of the Hanau Articulator—Dr. Felix French.
- "Root Resection, the surgical removal of an impacted and hidden third molar, and the surgical preparation of a jaw to receive a denture."
- "X-ray Interpretation."
- "The Bearing of Faulty Diet on Dental Diseases"—Dr. Kurt Thoma.
- "Vitamines"—Prof. Macallum.
- "Method of Tooth Brushing"—Dr. Paul Stillman, New York.
- "Opening and Filling of Root Canals"—Dr. Harry B. Johnston, Atlanta, Ga.
- "Oral Diagnosis."
- "Digital Diagnosis and Use of Diagnostic Lamp"—Dr. Thos. P. Hinman.
- "Industrial Dentistry and Office Management"—Dr. J. S. Dohan.
- "Crown and Bridge and Porcelain Work"—Drs. Clappison and Stewart.
- "Extracting of Teeth and Root Resection Operation with new Technique for local Anæsthetic"—Dr. Posner.
- "Prosthetic Dentistry"—Dr. A. A. Nelson, Detroit.
- (Clinic and lecture.)
- Progressive table clinic on the use of the Hanau Articulator in Prosthetic Dentistry, by Drs. Cameron, Dohan, Ross Cleveland and F. G. Henry.
- Illustrated address on "Preventive Dentistry"—Dr. Wallace Seccombe.
- "Cast Clasp Partial Dentures"—Dr. Polk Akers.
- "The Effect of Diet on the Human and Animal Dentition"—Dr. F. G. Wells.
- "Exodontia"—Dr. George B. Winter, St. Louis, Mo.
- "Pyorrhœa: Its Causes and Treatment"—Dr. Thomas B. Hartzell, Minneapolis.
- "Orthodontia for the General Practitioner"—Dr. J. Lowe Young, New York.
- "Fixed Bridgework Special Casting Technique"—Dr. L. Woodworth, Chicago.
- "Radiology"—Dr. Herman Osgoode, Boston.
- "Importance of Orthodontia," illustrated with specially prepared slides and models.—Dr. A. W. McClelland.
- "Radiography"—Dr. A. L. Walsh.
- "Articulator"—Mr. Hanau.
- "Tuberculosis"—Dr. J. Roddick Byers.
- "Bridgework"—Dr. Theo. Maves, Cleveland.
- "Pyorrhœa"—Dr. J. Oppie McCall.
- "Amalgam"—Dr. William Harper, Chicago.
- "Porcelain Jacket Crowns" (Illustrated by Moving Pictures)—Dr. H. Spalding Both, New York.
- "Recent Research on Diet in its Relation to Prevention of Diseases of the Teeth"—Dr. J. Sim Wallace, London.

SENSITIVE TEETH.—When syringing out a mouth with the compressed air spray, cover a sensitive tooth cavity with the tip of the forefinger. Although the spray bottle warmer may maintain the liquid at mouth temperature, the force of the spray will always cause a certain amount of pain in a sensitive cavity. Repeated spraying may cause hyperæmia of the pulp, which can be avoided by the simple precaution mentioned above.—*Dental Science Journal of Australia.*

Report of Canadian Dental Hygiene Council*

W. CECIL TROTTER, B.A., D.D.S.



S Chairman of the Executive Committee of the Canadian Dental Hygiene Council, I can assure you that the Council appreciates the privilege of giving you a short account of the Council and its activities since the last meeting of your Association in Vancouver, when you were good enough to recognize our status as more or less of a clearing house for oral hygiene work throughout the Dominion.

At that time, in 1924, the C.D.H.C. was very much in its infancy and scarcely organized. I think Dr. Grant, the Secretary, explained to you the reasons for the formation of the Council; that it was felt that the best interests of oral hygiene work throughout the Dominion would be furthered by the organization of a Council such as this, which embraces in its membership laymen as well as dentists and medical men, thus affording a larger field of support and, at the same time, lessening the possibilities of our profession being accused of carrying on oral hygiene propaganda work to further our own selfish ends. It was with this in mind that we secured the co-operation of such splendid men as General the Hon. S. C. Mewburn, K.C., as President of the Council, and Mr. E. E. Reid, B.A., manager of the London Life Insurance Co., as its Vice-President. Dr. Geo. G. Nasmith, C.M.G., of the Canadian Red Cross Association, is a member of the Executive Committee. Other members of the Executive are:—Dr. R. H. Wilson, of Vancouver; Dr. G. N. Stults, of Halifax; Dr. J. F. Morrison, of Winnipeg; Dr. Eudore Dubeau, of Montreal; Dr. Ferguson, of Saskatoon; Dr. Jewet, of Ottawa; and the Toronto members: Drs. Grant, Seccombe, Broughton, Reade, Ellis and myself. Dr. H. E. Eaton was a very valued member of the Executive right from the first, and his sudden death, last month, is going to be a very serious loss to the Council. Dr. E. A. Grant has been Secretary of the Council from its inception, and did a great deal of arduous work in connection with organization and getting the charter. I am sorry to say that he now feels he can no longer spare the time from his other duties, and wishes to be relieved of his work as Secretary. The Executive Committee meets about once a month, except during the summer, but a small sub-committee, consisting of Drs. Grant, Ellis, Reade, Harry S. Thomson and myself, meets more frequently and attends to all the financial and managerial work of the Council, reporting back to the full Executive.

In Ontario there is the most complete co-operation between the Oral Hygiene Committee of the Ontario Dental Association, Dr. Conboy—the Director of Dental Services for the Ontario Government—and the

*Read before Canadian Dental Association, Halifax, August, 1926.

Canadian Dental Hygiene Council. The Council only carries on work in Ontario at the request or with the consent of these two bodies. The appointment of Dr. Conboy as Director of Dental Services, or Provincial Dental Health Officer, has been a most outstanding success, and has greatly advanced the oral hygiene work of the Province and put it on a definitely organized basis. If the dentists of the other provinces will study the results of this appointment by the Provincial Government of Ontario, I am sure they will bring pressure to bear upon their own governments to follow in the footsteps of Ontario in this regard. This Council is ready to assist any other province in every way possible to bring about such an appointment by the persistent education of public opinion in this direction. Every Provincial Dental Association, as well as our Canadian Dental Association, has the privilege of appointing representatives on the Council, and we are ready at all times to assist the Provincial Dental Associations or their oral hygiene committees to the limit of our ability. I am anxious that every representative, or his proxy, from all the provinces will meet with members of our Executive present here in Halifax at some opportune time during this meeting, so that we may be able to get a general exchange of ideas in regard to the best means of carrying on oral hygiene work throughout the Dominion.

We can assist in the dental health educational work of any province in many different ways, such as supplying charts, lantern slides and moving pictures, or material suitable for dental health talks to service clubs, women's organizations, school children or public audiences. In some cases we can loan the services of our Field Secretary to organize and carry on a dental health campaign.

The Council will do all in its power to help to make the Ontario Dental Health Day on Wednesday, October 20th next, a success. It is being held under the auspices of the Ontario Department of Health, and will be supported by the Ontario Department of Education, the Ontario Medical Association, the Ontario Dental Association, the Ontario Press Association, the Ontario Red Cross Association, and the various service clubs and welfare organizations. If the day is the success we all think it will be, no doubt other provinces will attempt a similar day, and this Council will gladly help them in any way possible. Of course, the fact that Ontario has such an efficient Dental Health Officer in the person of Dr. Conboy, and that he has undertaken to organize and manage the Dental Health Day arrangements right from his office, where the clerical work can be done by his staff, is a decided advance in such an undertaking.

During the past two years the Council has done a great deal of work from Coast to Coast, educating the dentists as to the nature of our work and its opportunities for usefulness. The interest with which this information has been received, and the co-operation given, has been most encouraging and has more than justified the formation of the Council. Much time has been spent educating the Cabinet Ministers at Ottawa

as to the important influence the work that we are doing will have upon the general health conditions of the Dominion, and we have urged upon them our right to participate to some extent in Federal money grants made to health organizations similar to ours, such as the Social Hygiene Council and the Mental Hygiene Council. Though we have not yet succeeded in getting any financial recognition from the Government at Ottawa, we feel we have paved the way for a later effort when the political situation becomes more stable.

With the continued co-operation of dentists and their influential friends throughout the country, we are bound to succeed ultimately. At present our only source of revenue has been donations received from the dental societies and individual dentists. The Ontario Dental Association has been particularly good in this respect. Assistance of this kind has enabled the Council to occasionally send our Field Secretary, Dr. Harry S. Thomson, through the provinces to assist the various dental associations and their oral hygiene committees in their public dental health educational campaigns. The services of Dr. Thomson are very generously loaned to us by the Canadian Oral Prophylactic Association, and if we could receive sufficient money from other sources we would be able to loan his services to other provinces most of the time.

At present we are endeavouring to arrange for the establishment of some Dominion-wide plan whereby the teeth of immigrants may be examined and, if possible, looked after before they reach their destinations. With the assistance and co-operation of various dental associations and organizations, such as the Canadian Red Cross Society, we soon hope for success in this undertaking.

This Council looks forward to the time when each province will have a Provincial Dental Health Officer who will co-operate with the oral hygiene committee of its Provincial Dental Association in promoting dental health education throughout the province. As soon as a few of the provinces are organized in this way, it may be possible to persuade the Dominion Government to appoint a Dominion Dental Health Officer, whose duty it will be to look after the dental health of inmates of Dominion institutions and to co-operate with the various Provincial Officers and committees in the work in their respective provinces.

I find that this Association has asked Dr. Harry S. Thomson, the Field Secretary of the C.D.H.C., to give a brief account of his activities in connection with the Council, and to explain to you in what way we can assist the various provinces in their oral hygiene work, so I have confined my remarks to a more or less official statement of our organization and its aims.

TRANSFERRING MERCURY.—As a practical hint, I wish to suggest the use of an eye dropper to transfer mercury from a large container to the small mercury holder. This allows one to see how much he needs, thus avoiding overflow as when funnel is used.—*Cosmos*.

A Fatal Accident Through the Short-Circuiting of the Secondary Current

G. A. WETTERSTRAND.



UNIQUE accident which cost the life of two persons, the doctor and the nurse, took place in October, 1924, at the Mantta Works, Finland. The x-ray apparatus was a modern small diagnosis apparatus, designed for Coolidge tubes and a supply voltage of 220 volts A.C. The dimensions of the room were small, $310 \times 415 \times 260$ cm.; the floor was of wood.

The intention was to radiograph the left ankle of the patient, who was lying on a table. After the light had been extinguished and the high-tension had been switched on, the doctor approached the x-ray tube, which occupied an almost horizontal position, and the cathode end of which was on his right side. The nurse was standing near, to the left of the doctor, who, with the intention of centering the tube, put his right hand near the neck of the cathode. At that moment the patient felt an electric shock, with rays passing up his left leg and, according to his own statement, lost consciousness for a moment, but immediately afterwards recovered and found himself sitting on the floor in the antechamber. The helpers, who arrived immediately, observed smoke and flame in the room, and both the doctor and the nurse lying dead beside one another on the floor. The clothes of the latter from her feet half-way up her body were in flames, and also the fallen apparatus. The fire was extinguished immediately.

The fact that the patient escaped unharmed was due to the circumstance that he came into contact with only one pole. The fatal result for the two other persons present is explained by the fact that they were standing near one another and that, as the patient afterwards remembered, the nurse had put her left hand near the region of the anode, probably with the intention of assisting the centering. Thus it must be assumed that the two persons, coupled in series-parallel with the Roentgen tube, were struck by the high-tension current. This view is confirmed by what was found at the medico-legal inquest. The blisters discovered on the right thumb, index-finger and long finger of the doctor, and the oxide spots on the nickel-plated cathode cap, show that he had touched the cathode with his right hand. The patient's assertion that the nurse's left hand was near the anode was confirmed by the lesion on her left index-finger, which is characteristic of electric shocks. This view of the course of events is finally completed by the finding of large deep burns on the left elbow of the doctor and the right arm of the nurse, which undoubtedly arose because the high-tension current had found its way in the form of an arc of light between

the two persons, who were standing close to one another, and who were each connected with a pole of the tube.

It is well known by all x-ray workers, of course, that touching one of the high-tension wires or the tube pole should be most carefully avoided when the current is switched on. Even if this takes place, however, there may be no very serious consequences, particularly if the high-tension parts are not connected to earth, as was the case with the apparatus in question. In this case, therefore, if the two persons had stood at a greater distance from one another, they would have had a shock without any very serious consequences.

At the investigation of the apparatus—undertaken by myself and an expert in electro-technics, who had been called in—the erection, the earth connection, etc., did not reveal any faulty conditions whatever. The fact that the accident could take place at all can only be ascribed to the circumstance that the two victims were completely inexperienced, both in the simplest principles of electricity and in the sphere of Roentgenology. The doctor, who had no special knowledge of the subject, was handling the apparatus for the first time, and, despite the warning he had received when the apparatus was set up, he did not realize the danger of handling the high-tension current directly. It is evident that the measures of precaution and isolation that are at present in use, and on the improvement of which work is still going on, cannot avail to prevent the occurrence of cases like that above described. The question as to how similar occurrences are to be avoided in the future forms a chapter in itself, and lies outside the range of this article. But so much at least may be said, that it is very intimately connected with the training of physics that the future doctor has received.—*Acta Radiologica*.

BLEACHING ORGANIC OR NON-METALLIC STAIN.—The best thing for bleaching organic or non-metallic stain is to ream out the canal very carefully, cutting away also part of the body of the discoloured dentine, being sure that at least the apical third of the root is thoroughly sealed. Fill the pulp chamber and the orifice of the canal with loose, dry cotton and seal in thoroughly with hot gutta-percha, after which drill a small hole into the centre of the gutta-percha stopping, being careful to keep away from the cavity margins. Now with long-pointed pliers carry sufficient pyrozone through the opening in the gutta-percha stopping to moisten the cotton within. After which seal the stopping with a real hot spatula. This pyrozone, or 25 per cent. solution of dioxogen is, when properly contained and sealed, a most efficient bleaching agency.—*Dental Digest*.

The Tooth Brush as a Herald of Health

Junior Red Cross of Saskatchewan Sends Thirty-Five Gallons of Cod Liver Oil and a Tooth Brush Each for the School Children of Charlebois and Cumberland House Districts.



THAT the humble tooth brush has taken its place as an accepted sign manual of health is abundantly proven by the following news item concerning Red Cross peace activities in Saskatchewan and what happened after medical and dental inspection of the school children in the Charlebois and Cumberland House districts.

"Thirty-five gallons of cod liver oil have been shipped by the officials of the Red Cross Society in Saskatchewan to the Charlebois and Cumberland House school districts in order that a daily ration of one-half ounce of this vitamin-laden food might be given each school child in these regions. Government reports in Saskatchewan showed last year that medical inspection of the children in the schools at Charlebois, Sturgeon Landing and Cumberland House had revealed a disturbing condition of general malnutrition among them, with a correspondingly great tendency to the wasting diseases. Among the populations in these settlements, most of whom are of native Indian or partially Indian extraction, the common diet consists of hard bannock, dried fish and tea, a diet quite lacking in the growth elements necessary to the children, whose teeth and general physical condition suffer in consequence.

The Junior Red Cross Society of the Province, having the facts presented to them, offered to supply a tooth brush for every child, enough cod liver oil to ensure each one a daily ration of the necessary amount of vitamins, and funds to provide for any needed dental or throat operations on the suffering children in these settlements. The Commissioner of the Saskatchewan Division of the Canadian Red Cross Society now reports that all these matters are under way and that the teachers in the various school districts are overseeing the distribution and application of the various curative measures."

Sleep and the Present-Day Child



LMAINTAIN that the want of sleep has by far the most to answer for in the badly-developed and soft nature of teeth of the present-day child. I suppose we, as dentists, agree that the teeth of this generation of children cannot be compared with the teeth of the same class of sixty to eighty years ago; and the children at that time were put to bed at a respectable time—six or seven o'clock in the case of children from two to seven years of age: those aged seven to twelve might be allowed to remain

up till eight o'clock; then they had the chance to get the sleep which Nature required to repair the waste and renew the vigour necessary for an active, growing child. How often do we see children in arms, wee mites from two to seven, or even up to ten years of age, out in the streets (as I did recently in Sunderland) at nine or ten o'clock at night, when most of them ought to have been asleep three to four hours previously. I was speaking lately on the subject to a school teacher, and she assured me that she was fully persuaded that want of sleep was responsible for the dullness and want of attention early in the mornings in a number of scholars. I suppose advice is given at child welfare centres on the amount of sleep required by a growing child (I am not speaking now of children in arms), but, if not, then here is scope for propaganda work both for voluntary helpers and officials."— T. W. MORTON, L.D.S., R.C.S., Edin., in *The British Dental Journal*.

The Common Cold



COLDS are produced by microbes which invade the nose and throat. Avoid the microbes. Destroy the microbes. Raise your personal resistance against the microbes. When infected, consider other people. Breathe through the nose only.

AVOIDANCE.

Colds are spread by infected toys, sponges, towels, pillows and handkerchiefs, etc. Close contacts pass the germ from one victim to the next. The air is contaminated for a considerable distance around a patient who has just sneezed, coughed, expectorated or even merely spoken. Infection is, above all, from mouth and nose to mouth and nose. Do not speak into the mouth and nose of other people, or let them speak into yours. The ear is the organ of hearing. The sufferer from a cold is a serious danger to other people. He should isolate himself, if he can, and always sneeze into a handkerchief.

DESTRUCTION.

Warmth and moisture prolong the life of microbes floating in the air. Therefore, keep your rooms cool, dry and well ventilated.

Sleep with the bedroom windows open, but do not allow a direct draught to blow on the head and neck. Sunlight kills microbes and raises our resistance against them, but these health-preserving properties are destroyed if the sunlight passes through ordinary glass. Let it stream into your rooms freely through widely opened windows.

RESISTANCE.

A "responsive" skin is a great safeguard against chills. Foster this responsiveness by accustoming your skin to cool air and water, as by

bathing, cold sponging, cold showers, outdoor exercise in light clothing, and by avoiding scarves, neck wraps and heavy overcoats.

But do not sit in a cold place or a draught on coming from a hot room or after hard exercise.

Indigestion and constipation weaken resistance seriously and leave you a prey to infection.

Avoid excess of sugar and eat wholemeal bread, raw fruit, raw salads, green vegetables, rye bread, and fresh butter freely.

NOSE-BREATHING.

One should breathe through the nose. "Unless you have something to say or to swallow, your mouth should be shut." Both nostrils must be clear. If they are not clear consult your doctor.

A few simple nose-breathing exercises carried out each morning are invaluable.

On these occasions it is best to breathe in energetically, making a definite sniffing noise and filling the chest to its utmost capacity, but the air should be expelled again slowly and quietly.

Chronic catarrh and colds which occur with great persistency commonly afflict persons who have something the matter with the nose and throat, or in whom some underlying cause of continued low resistance is at work.

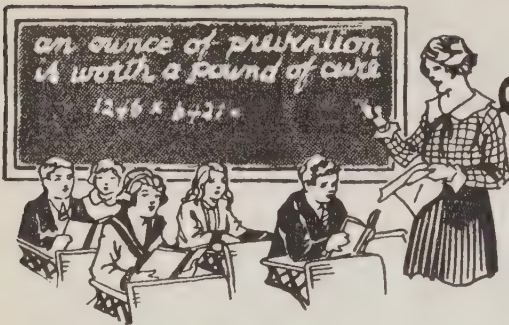
For such cases the skill and advice of a medical practitioner are needed.—*The New Health Society.*

Dentistry and Ill Health



THE committee appointed by the British Government in 1919 to enquire into the conditions which then obtained in the practice of dentistry, concluded its report with the following paragraph:

- "We wish to state very strongly that, in our opinion, the State cannot afford to allow the health of the workers of the nation to be continuously undermined by dental neglect. Steps should be taken without delay to recognize dentistry as one of the chief, if not the chief, means for preventing ill-health, and every possible means should be employed for enlightening the public as to the need for conservative treatment of diseased teeth. The dental profession should be regarded as one of the outposts of preventive medicine, and as such encouraged and assisted by the State. Treatment should be rendered available for all needing it. The present anomalous position in which an uneducated, untrained person can practise as a dentist, performing surgical operations on the teeth and jaws, doing untold damage and casting undeserved odium and dishonour on a scientific profession, is intolerable, and should be dealt with immediately."



School Dentistry

This Department is Edited by

EDMUND A. GRANT, D.D.S.

Director of Dental Services—Department Public Health, City Hall, Toronto.



We are anxious to receive for publication in this Department reports of work carried on in School Dental Centres anywhere in Canada. Papers on any phase of Pedodontia would also be welcome.—E.A.G.



Fort William, November 25th, 1926.



WING to the fact that on November 24th was held the first meeting of the Thunder Bay Dental Society, since the school examinations were completed, and as the society wished to pass on the report before it was sent in, I herewith enclose the report of the Fort William schools; and you will note the terrible condition of the school children's teeth—without a school clinic.

Leading up to the Dental Health Day, starting on October 9th and 10th, Dr. Blatchford addressed the District School Teachers' Convention, and explained to them the principles of oral health, and why they should attend to their teeth; and also explained the charts, etc., which were to be used in the examination of the school children, and asked for their co-operation in the examination. Booklets and Health Talks were distributed to the different teachers. On October 12th and 13th the convention of the Women's Institute was held here. This represents about three hundred different women from as many rural parts of the district, including Kenora, Fort Frances, etc., and other adjacent points. Dr. Blatchford addressed this gathering too, and gave out booklets and pamphlets for them to take back to their communities.

The local newspaper, *The Daily Times Journal*, gave splendid co-operation, by publishing, daily, oral health talks, also by giving a real good editorial on the subject. Mrs. B. O. Allan, Ladies' Editor, who was also president of the Women's Institute, deserves a lot of credit for her help—unfortunately Mrs. Allan died on November 15th and will be greatly missed in the community.

The School Board, with Superintendent W. W. Southon, also assisted in an untiring way, also the teachers, at the various schools, who

had the charts filled out, names, etc., in alphabetical order, in readiness for the examination. We were given a desk at the schools, and the children were paraded up, room by room, and as we examined the child, the teacher would mark the chart for us, thereby speeding up the examination.

The film was shown at the local picture house, and bills, etc., were posted up in places of vantage around the city.

The chairman of the local Board of Health was very much interested, and apparently he is very keen to get something started to remedy these defects, and no doubt you will hear from him before very long on this subject.

We are in receipt of a letter from Mr. W. W. Southon, Superintendent of the School Board, thanking us for examining the children's teeth, and also enquiring as to what was going to be done to overcome the situation. Mr. Southon is very keen in getting something started right away, but is waiting to see what the Board of Health will do first.

Hoping that this conveys the information that you wish, I am,

Yours fraternally,

(Sgd.) J. H. LANGTRY,

Secretary.

REPORT OF DENTAL SURVEY—FORT WILLIAM SCHOOLS—OCTOBER, 1926.

LOCAL DENTAL ASSOCIATION.

School	Total on Roll	Exam- ined	Showing Previous Work	Need Clean- ing	De- fects Perm.T.	De- fects Temp.T.	Period- ontitis	Ortho- dontia	Perfect Masti- cation	Septic Condi- tion
Central:.....	495	478	254	461	1078	1241	—	125	18	18
Drs. Mitchell & Legge.										
Drew:.....	495	480	76	204	523	1192	3	24	46	27
Dr. Langtry.										
Francis:.....	643	576	73	480	433	815	3	68	—	139
Dr. Quackenbush.										
Franklin:.....	527	505	103	320	428	858	2	9	21	180
Dr. Strachan.										
Isabella:.....	457	441	78	242	256	255	3	1	—	164
Dr. Gellatly.										
Ogden:.....	814	776	122	612	1875	2059	10	166	32	32
Dr. Legge.										
Crawford:.....	461	426	21	251	572	990	5	25	—	25
Dr. Macdonald.										
Total.....	3892	3682	727	2570	5165	7410	26	418	117	585
SEPARATE SCHOOLS—										
St. Stan. &.....	474									
St. Martin's.....	183	639	312	570	846	880	6	16	—	214
Dr. Sinclair.										
St. Peter's.....	674	655	208	622	2329	752	1	1		447
Dr. Blatchford.										
Total.....	1331	1294	520	1192	3175	1632	7	17	—	661
Grand Total....	5223	4976	1247	3762	8340	9042	33	435	117	1246

Fort William, Ontario, November 9th 1926.

Report From Almonte, Ontario



THE dental examination at the Public and Separate Schools was successfully carried out and a complete tabulation of necessary work made. This was made in chart form, and from the original a duplicate copy was taken, and the other is in the class-room for future reference, if desired.

We also instructed a pupil in each class how to properly use the tooth-brush, and then had him do so before his class, that all might get the benefit.

There were some pupils absent on the day of our visit, but we examined in all 347 pupils.

We wish to report that on the whole examination we find about ninety per cent. of the pupils require some treatment, but about seventy-five per cent. have healthy mouths. The great part of the work required is for the younger pupils, from six to ten years, the filling of temporary teeth, also of permanent six-year molars, and extraction of abscessed temporary teeth. Several cases presented showed the six-year molar almost gone. This one, the parents believe to be a temporary tooth.

We wish to thank you, the teachers, and members of the school board, for your hearty co-operation, and trust that what we have done will be of some benefit.—Examinations, Dr. Paterson, 107; Dr. McGregor, 134; Dr. Johnson, 117.

Incidence of Tuberculosis



THE flappers cap the climax. It is shown that the female death rate from tuberculosis exceeds that of the males at the age of 5 to 9 years. It is nearly 50% higher than that of the males at the ages of 10 to 14 years, and nearly twice as high at the ages 15 to 19 years, the latter being the flappers' age group. Frederick L. Hoffman, who is the authority for these statements, is of world repute as a reliable statistician. He further states there are, in his opinion, three outstanding reasons which, to a large extent, explain the actual and relative decline in pulmonary tuberculosis death rates:—(1) Higher wages, giving better nutrition and building up bodily resistance; (2) Shorter hours, preventing fatigue and giving better opportunities for outdoor life and recreation; (3) Better shop hygiene or improved conditions of air and ventilation, light and sanitation otherwise. Hoffman states:—"Where these three fundamental causes are combined they will, in my judgment, fully account for the major portion of the observed decline."

Public Dental Health Education

"The public has decided it wants health talk and means to get it! The lay press is the most powerful medium of instruction for the public in health matters. We must do our best to secure its co-operation!"—Sir Thomas Horder.

IN this department each month will be published short articles suitable for use in the public press. The material has been authorized by the Oral Hygiene Committee of the Ontario Dental Association and members of the profession may feel free to arrange for its publication in the local papers or magazines.

WHAT LOOSENS THE BABY TEETH?



YOU have watched in your small son these little teeth that were once so firmly rooted, gradually loosen and begin to wobble. For fear lest he might swallow one you tied a string around it and jerked it out; or else you just picked it off, and finding no root, you wondered what had been holding it in place, and asked yourself was it always so.

Now, as a matter of fact, the "baby tooth," upon eruption, *did* possess a normal root; then, where has it gone?

Well, you see, as the incoming permanent tooth begins to develop and push up, it must find room. So nature removes these little temporary teeth through the absorption of the root, allowing the crown to fall away—a process that is attended with no pain or outward disturbances whatsoever.

But occasionally it happens that this natural process of root absorption is retarded, or it may be, does not occur at all, with the result that the little tooth does not loosen by the time the shedding process should take place.

This is due, probably, to the death of its pulp or nerve, preventing a quick natural absorption, or it may be, to the tardy development of the replacing permanent tooth or to its eruption into an abnormal position, or possibly to the non-development of what should have been the succeeding tooth.

In any case, your dentist will be best able to advise you as to whether this unloosened "baby tooth" should come out now or at a later date.

* * *

WHY "NEW TEETH FOR OLD?"



PERHAPS you were wondering why little Sonny had to lose his "baby" teeth and have them replaced with new ones.

Why, you ask yourself, do they not remain permanently and develop in size, during the growing years, just as do the ears and the eyes?

"Because they become decayed" you say; but not necessarily so, since tooth decay is a disease and is, therefore, abnormal and prevent-

able; and, for that matter, when you lose a tooth through decay at six and twenty, does a new tooth replace it?

But consider: You have seen a little sapling grow to be a big tree—"large oaks from little acorns grow," but did you ever hear tell of a small pebble growing to become a large stone? Not likely so, and for obvious reasons, for, as you know, the tree is of organic matter, while the stone is of inorganic.

Now the tooth, being composed largely of inorganic matter, especially the outer enamel covering, which is almost wholly so, like the pebble, cannot of itself change in form, and so grow larger once it is fully developed.

Obviously, too, Sonny's little jaw has no room for the larger teeth that he will need when he is fully grown.

So, unlike the potatoes that "from little ones do big ones grow," we have instead, "new teeth for old."

These baby teeth then serve, temporarily, for mastication until the maxillary or jaw bones are sufficiently developed to accomodate the larger permanent teeth of adult age.

They are mother nature's expedient, as it were, and a good expedient too, if given half a chance.

* * *

CHILDHOOD DISEASES AFFECTING TEETH.

T occasionally happens that teeth erupt faulty in shape, or with the enamel pitted and stained, and you wonder what has caused it.

Now a very probable source of this trouble is a general disturbance from some constitutional disease associated with high temperatures, such as scarlet fever, measles, or chicken pox.

Occasionally this disturbance is so great as to totally destroy the tooth germ, but more often it merely affects the tooth structure as described above.

But there are two general diseases that, in particular, affect tooth structure and tooth eruption.

Of these, rickets is a disease of faulty nutrition, and it is worthy of note that it is a disease not only of the very poor, who are denied proper and sufficient food, but of the rich, who have an abundance of food but of an improper kind.

The characteristic affections of the teeth from rickets are these: the deciduous teeth erupt late and, in the more extreme cases, there is a general deformity of the skull and jaws; moreover, these teeth are lost early, whilst the permanent teeth in turn erupt late; the result is faulty or mal-occlusion. Moreover, the teeth themselves are structurally affected, being bluish, sparse and somewhat tapering.

The other disease, more or less specifically related to tooth malformation, is tuberculosis.

A child suffering from tuberculosis will erupt both the deciduous and permanent teeth early; but the root of the deciduous tooth is not absorbed as it should be, with the resultant mal-position of the succeeding permanent tooth.

It is, perhaps, easier to understand why these diseases should injuriously affect tooth structure as they do, when you remember that the teeth are in the formative stage throughout early childhood, and hence are readily liable to influences of a disturbing nature.

* * *

TOOTH-ACHE.



As a child, you may have thought a tooth solid right through, just as a piece of ivory which it resembled.

Then one day, you noticed that when something sweet got into the "hole" in the tooth, it hurt a little, but this soon passed away.

So you kept "mum" for fear you would have to go to the dentist, until one night you wakened your parents with crying and announced between sobs that your tooth was "hurting."

Now, what has happened? Within each tooth is a chamber that is filled with soft tissue—blood vessels and nerves—and the decay which is a disease process had been steadily progressing toward the "inside" until the soft tissue had become infected by the disease-bearing organisms.

Then Nature had rushed to the defence to combat them by sending into the tooth a greater supply of blood, containing millions of little warriors called "phagocytes." Some of these burst through the vessel walls to attack the organisms, and with this increase of blood there was a swelling of the tissue, causing increased pressure on the nerve endings—which signalled to headquarters—and so pain resulted.

And, just as in battle, as the fight wages the wires grow hotter—so the nerves signalled more furiously, crying loudly—until by and by the fight was over and the wires cooled off and the pain was stilled—and you were so glad that it was over, that you forgot to wonder how it stopped.

* * *

"CROOKED TEETH."



NATURE is no bungler, but plans wisely. So it is that she has intended teeth should occlude, or come together, in certain definite relationships, with cusps interlocking as "the cogs of two wheels which work in harmony."

But quite frequently her aim is thwarted, and there is an abnormal relationship known as mal-occlusion.

Many and varied causes, as have been cited, contribute to this condition, as: meddlesome extractions; decayed shedding; tardy eruptions; improper masticating habits; faulty diet; deforming habits of the young child; and general diseases affecting tooth development.

But there is a type of mal-occlusion, without the so-called "crooked teeth." The teeth may in fact be exceptionally well formed and placed normally in the arch, so that in this type the arch *per se* is at fault, either exhibiting a deformity or being in improper relationship to its fellow.

Mal-occlusion may be very noticeable, evincing a protruding or re-truding lower jaw, or other facial deformity; but again the facial contour may not be altered from normal to any appreciable extent.

Apart from this relationship to facial expression, however, mal-occlusion may lead to serious disturbances of the teeth themselves.

It may be that, due to this condition, one or several teeth are receiving excessive stress, resulting in a diseased condition of the tissues enveloping the tooth, or teeth, and menacing the life of the teeth involved.

Moreover, teeth that are not functioning properly through disuse may be weakened structurally, leaving them more prone to decay; and, in any event, they are not receiving the benefits of normal tooth exercise or of the mechanical cleansing, through excursive masticatory movements which, after all, is the best defence against the forces of tooth decay.

* * *

GREENSTAIN.



YOU are anxious that your child should have nice white teeth and you are endeavouring to get him to form the habit of daily care, with perhaps good success.

But you notice a dark greenish stain on his teeth right next to the gum, and which persists in spite of careful brushing.

So you wonder what it is and how it may be removed.

This, then, is "greenstain," and is commonly found on both the temporary and permanent teeth of children, being generally confined to the anterior upper teeth well up toward the gum.

The greenish colour is due to bacteria present, which find lodgment in these areas afforded by the remnant of a dead cuticle which often persists after the eruption of the tooth.

Where "greenstain" is permitted to remain for a considerable time upon these surfaces, the enamel will be found to be "etched" or roughened by dissolution, due to an acid which these bacteria produce. Unfortunately, this injury to tooth substance is permanent.

Now you can readily understand that these roughened areas will hold food particles and epithelial matter such as are found in a mouth where brushing is neglected—and with resultant decay.

The removal of greenstain had better be left to your dentist, who, by employing some abradant such as pumice, would be able also to smooth and polish these areas and thus check further deposits of this nature.

So not only, as you see, should greenstain be removed for appearance sake, but also as a prophylactic measure in the prevention of decay.



British Columbia—W. J. BRUCE, D.D.S.
404 Birks Bldg., Vancouver.

Alberta—JOHN W. CLAY, D.D.S.
914 Herald Bldg., Calgary.

Saskatchewan—O. W. PARKER, D.D.S.
Imperial Bank Bldg., Regina.

Manitoba—W. W. WRIGHT, D.D.S.
767 Warsaw Ave., Winnipeg.

Maritime Provinces—J. STANLEY BAGNALL, D.D.S., 34 Larch Street, Halifax, N.S.

Ontario—LIEUT.-COL. W. G. THOMPSON,
46 Sun Life Bldg., Hamilton.
STANLEY G. MCCAUGHEY, D.D.S.
384 McLaren St., Ottawa.

Quebec—ARCHIE N. JENKS, D.D.S.
Medical Arts Bldg., Montreal.
PAUL GEOFFRION, D.D.S.
308 Sherbrooke St., Montreal.

Provincial Editors will appreciate receiving from all local societies copies of papers, society proceedings or personal notes, for publication.



QUEBEC.

SOCIETE DENTAIRE DE MONTREAL.



HE regular meeting of the Societe Dentaire de Montreal was held at the University Club on December the 8th, 1926. Dr. Wallace Seccombe, Dean of the Faculty of Dentistry, University of Toronto, was the guest of honour. Doctor Seccombe gave a paper on "Diet as a Factor in Dental Diseases."

A hearty vote of thanks to the speaker was passed before adjournment.



Another regular meeting was held at the Faculty of Oral Surgery, Universite de Montreal.

The speaker was Dr. A. Jutras, Histologist at the Radium Institute of the Universite de Montreal, who gave a paper on "Embryology and Histology of Dental Tissues."

PAUL GEOFFRION,
Secretary.



THE MONTREAL DENTAL ASSISTANTS' ASSOCIATION.



R. A. L. WALSH, Director of the Dental Clinic, Montreal General Hospital, addressed a large audience of the Society, at their second Clinic Class, which was held at the Montreal General Hospital, Monday, January 10th, 1927.

Miss Ruth Firth, Chairman of the classes, presided.

Dr. Walsh spoke on "Oral Surgery and Sterilization."

Dr. R. Kennedy, of the hospital, showed the Dental Assistants, with the aid of slides and microscope, the mysteries of the tiny organisms which are grown or killed according to the will of the modern bacteriologist.

The principle of infection in wounds and sterilizing surgical equipment was expounded. It was shown that with absolute care a wound or surgical incision cannot become infected. To discover the remedy for the chief of local infection, *i.e.*, decayed teeth, is the task of the dentist and the bacteriologist. Dr. J. A. Kerr assisted Dr. Walsh in demonstrations.

Mme. Guay, President, and Miss E. McKee tendered the members' thanks to the speaker.

* * *

EASTERN ONTARIO.

 R. RISDON, of the Faculty of Dentistry, University of Toronto, addressed the January meeting of the Ottawa Dental Society on "Treatment of Maxillary Sinus, With Special Reference to Infection From Alveolar Process, and Surgical Cleanliness Relating to Such Operations."

* * *

We are happy to report the return of Dr. S. W. Bradley to his office. Dr. I. W. Hamilton has become his associate in the practice of Orthodontia.

* * *

Drs. Russell Beckett and Lorne E. MacLachlan have recently purchased the Graham Building, at 206 Laurier Ave. W., from Dr. Milton Graham. They expect to take possession about February 1st. Dr. Graham is taking over Dr. Beckett's offices on Sparks Street.

S. G. McC.

* * *

MANITOBA.

 HE Manitoba Dental Association, assisted by the Winnipeg Dental Society, used the occasion of their annual meeting to hold a short convention. On the evening of Saturday, January 8th, Dr. Sim Wallace, London, England, lectured before the Society at a meeting to which the medical men of the city had been invited; Dr. E. White, President of the Winnipeg Dental Society, presided. To me, the essay read by Dr. Wallace was lucid and interesting, but his reply to the discussion led by Dr. Cameron, biologist, and Dr. Garvin, only served to leave the feeling that the result of the evening was nil.

Dr. W. H. Lasby, Professor of Prosthetic Dentistry, University of Minnesota, carried through a full upper and lower denture case and a re-basing case. His manner and method of teaching immediately won

the hearts of all present, and several dentists who had come from outside points expressed their delight in being present at his clinics. The affair was arranged by the Manitoba Dental Association for the dual purpose of getting outside dentists to the annual meeting, and the clinical benefit. It succeeded in both, and this will quite likely be a regular feature of our annual meeting.

Those board members whose term had expired were re-elected, and the election of Board Officers resulted as follows:—

President—Dr. H. J. Merkeley.

Vice-President—Dr. C. H. Moore.

Secretary—Dr. J. F. Morrison.

Registrar-Treasurer—Dr. W. W. Wright.

Executive Members—Drs. H. A. Croll and E. H. Clark. (Dr. H. A. Croll was re-elected Representative to the Dominion Dental Council.)

The meeting decided to support the Canadian Dental Association on a *pro rata* basis, and to send two delegates to Toronto next May to assist in the re-organization of the Canadian Dental Association.

They also decided to co-operate with Saskatchewan and Alberta, with the object of routing clinicians through the three provinces in years alternating with the convention of the Dental Society of Western Canada.

Considerable discussion developed over the abortive work of our education committee, and the meeting resolved to place up to \$1,000.00 available for educational work in 1927, endorsing the principle of using newspapers, etc., if the committee wish to do so.

Principally on account of legal matters, the expenditures in 1926 had been abnormally heavy. The budget for 1927 adopted calls for disbursements much above the usual, so it was decided to raise the annual dues from \$5.00 to \$10.00.

* * *

Winnipeg citizens are tendering Mr. S. A. Blair a complimentary banquet for his services during civic elections and other public activities.

* * *

About thirty members of the C.A.D.C. held a reunion banquet at the Fort Garry Hotel on January 8th. Several outside members were present, including Drs. Pickering, Croll, Cleave and Graham; Dr. Sim Wallace was also present. Election of Officers resulted as follows:—*President*, Dr. K. M. Johnson; *Secretary-Treasurer*, Dr. W. A. Myles; *Executive Committee*, Drs. D. A. P. McKay, F. Moffat and J. A. Dow. A resolution was passed protesting against the dental services of the Soldiers' Civil Re-establishment being administered from Ottawa by a medical officer, and that a copy of resolution be forwarded to the Members of Parliament of our Province.

—W. W. W.

ALBERTA.

DR. J. SIM WALLACE and Mrs. Wallace were guests recently of the Calgary Dental Society and surrounding district, at a dinner given at the Palliser Hotel. The chairman of the meeting was Dr. V. Harold Macaulay, the President of the Society.

The courtesy of the California State Dental Association in making this visit possible was much appreciated, as well as was Dr. Wallace's kindness and courtesy in bringing his interesting work to Calgary.

While no subject was given, it would be fairly accurate to state that he spoke on "The Dietetic Factor in Preventive Dentistry." Dr. Wallace's theory of the lessening of decay of the teeth was purely one of local effect, and little more than what might be described as mechanotherapy. The local effect of mastication of foods of certain types, and the immediate local effect of the qualities of the food on the environment of the teeth, were to him the only factors of much importance.

Many of those present are still not prepared to accept the view that what appears to be hereditary influence, is mainly a matter of habits of diet, that the lessening or increasing of caries in the mouth is wholly due to the local conditions and may not be due to changes in the metabolism of the individual affecting local conditions, nor to give up all idea that prenatal and early childhood feeding of the proper sort has some considerable influence on the susceptibility of the teeth to caries in later years.

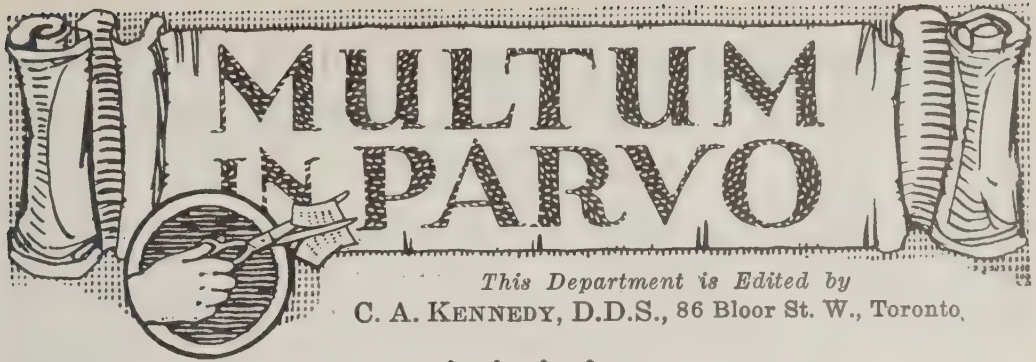
It may be that we are clinging to an obsolete idea, like the "flat earth" societies which still exist to promulgate the idea that the world is not round, and that later we will be found following in Dr. Wallace's train. We could not but be impressed with Dr. Wallace's wide knowledge of his subject, though we are not able to agree in full to the logic of his ideas.

* * *

Dr. M. L. Moore, of Medicine Hat, was recently elected to the Medicine Hat School Board, with by far the biggest vote polled for any candidate. He has been appointed Chairman of the Grounds and Sports' Committee.

It is to be hoped that the performance of the duties of his office, as well as attendance on his patients, will not cause him to neglect the finer and more important things of life, such as golf, curling, hunting and all such kindred occupations.

TO REMOVE OLD AMALGAM FILLINGS.—Cut a chisel edge at the end of an old fissure drill and cut into the amalgam with this. If it is a large lower filling to be removed, drill a hole in the centre and put a drop of mercury in. Allow to stop there for one hour or two, then the removal will be an easy matter.



GOLD FILLINGS VERSUS FALSE TEETH.—An anonymous correspondent of the *Scotsman* writes to that journal as follows:—

“I was very much interested in reading in to-day’s issue of the *Scotsman* the report by Dr. Guy, and the remarks by Mr. J. W. Dowden at the prize-giving ceremony in connection with the Edinburgh Dental Hospital School.

“Mr. Dowden referred to the peculiar fact that such an enormous number of people of to-day are lacking their own teeth, and stated whether that has to do with this age of hustle and bustle and varied diet he could not say.

“Dr. Guy, in his report, referred to a further curious fact, viz., the scarcity of entrants for the gold-filling competition.

“I venture to suggest that the peculiar fact that such an enormous number of people to-day in this country are lacking their own teeth is due in a very large measure to the scarcity of gold fillers in the dental profession.

“Recently, when in China and Japan, I was struck by the fact that in those countries people with teeth other than their own were hardly to be seen; but, on the other hand, it was a striking fact that gold-filled teeth were to be seen among even the poorer classes in those countries. The poor women who assist to coal ships at Moji, the centre of the coal mining industry in Japan, have no teeth other than their own, and generally one or two of them are gold filled.

“Whatever the explanation may be, it is a strange fact that gold-filled teeth are common in China and Japan as false teeth are common in this country. One can see more ghastly false teeth in Edinburgh in an afternoon than can be seen in either China or Japan in a week.”

If, as is suggested in this letter, the filling of teeth with gold is not being taught or practised as much as formerly, the matter is one for deep regret. The skill attained by continually filling teeth with gold cannot, as far as our experience goes, be gained in any other way. We go further, and suggest that unless a man can do gold fillings he cannot be a really good filler of teeth with any other material. As to the ghastliness of many false teeth, we are in full agreement with the writer. This is due partly to the lack of appreciation of natural forms and colours on the part of some dentists, partly to the bad patterns turned out by some manufacturers of artificial teeth; but most of all to the refusal of some patients to accept any but small white teeth.

Canadian Dental Hygiene Council Received Gift of \$2,500 from Canadian Red Cross Society

[The author of this article is Dr. George G. Nasmith, C.M.G., D.Sc., D.P.H., of the firm of Gore, Nasmith & Storrie, Consulting Engineers and Public Health Specialists, Toronto. Dr. Nasmith is adviser in Public Health to the Canadian Red Cross Society, Chairman of the Junior Red Cross and Home Nursing Committees, a member of the Executive and Council of the Society, and now a member of the Canadian Dental Hygiene Council, where his excellent work is greatly appreciated by the executive of the Council.—Editor.]



PHYSICIAN, well known throughout Canada as an outstanding authority on tuberculosis, said to me recently, "Don't you think that the greatest advance in preventive medicine in the next decade in Canada will be a general reduction in cases of heart disease, due to improvement in oral hygiene and preventive dentistry?" I agreed, for that seemed to be a logical deduction from what we know about the connection between focal infections in the mouth and heart disease and arthritic conditions.

In the development of the art and science of medicine the pendulum swings first to one extreme and then to the other. Over enthusiastic support of a theory in one quarter is almost sure to bring rabid opposition from another quarter by those, who, with equal enthusiasm, attempt to disprove that theory. And it frequently happens that both sides are shown to be partly right and partly wrong, and that the truth lies more or less midway between.

This is the case at the present moment in the field of dentistry where enthusiasts, both dental and medical, have blamed diseased teeth for most of the cases of heart trouble, arthritis and what not. The result has been that many people have been deprived of perfectly good teeth, their so-called "rheumatism" or general health has not improved, and the inevitable conclusion has been reached that dental disease had nothing to do with the disease. It is undoubtedly true that many people pass a large part of their lives with abscessed teeth, pyorrhœa and diseased tonsils, without apparently suffering in any way from such conditions. And it is equally true that there are large numbers of clear-cut, authentic cases where the removal of one or more abscessed teeth, or a slightly diseased tonsil, has resulted in almost miraculous cures. The writer is able to speak with feeling on this point, having spent six months in bed with acute arthritis, and another six months on crutches, as the result of one diseased tooth and one bad tonsil, the removal of both resulting in an immediate and startling improvement and eventually a cure. A sufficient number of cases among personal friends and relatives who have made wonderful improvements in health following the removal of dental infection, without other treatment, is a sufficient

proof to me, personally, that the cause of many cases of ill-health is due to diseased teeth.

When, therefore, I was nominated by the Canadian Red Cross Society to be its representative on the Canadian Dental Hygiene Council I was already interested in preventive dentistry, both from personal experience and observation, as well as from the public health standpoint. The general health campaign of the Red Cross Society in peace has included a great deal of co-operation with members of the dental profession. Travelling dentists have been employed in some provinces to visit rural districts to correct dental defects of children, and tens of thousands of cases have been so looked after through Red Cross agencies.

In the Junior Red Cross of Canada there are now 137,000 children busily engaged in playing the health game and developing good health habits, some of which are the correct brushing of teeth, the eating of some whole grain products and fresh vegetables every day, and the drinking of milk.

In the Senior Red Cross Magazine, which has a circulation of about 60,000 copies a month, numerous articles on mouth hygiene have been published. In the Junior Red Cross Magazine, with a circulation of 20,000 copies a month, articles on the care of the teeth appear also, as well as numerous pictures and references to the value of healthy teeth and how to keep them in good condition. In connection with the thirty-nine Red Cross outpost hospitals, scattered across the northern parts of our provinces, it has not been feasible to carry on any organized dental work, though the need in such districts is undoubtedly very great. It has been possible, however, to stress the value of sound teeth and healthy mouths, and to show the relationship between the proper kind of foods, good teeth and general health, to the 10,500 women in Canada who have taken the course of twelve practical lessons in Home Nursing given by the Red Cross Society.

From this it may be seen that the Red Cross Society is interested in preventive dentistry, so much so in fact that the work of the Canadian Dental Hygiene Council, as it relates to the general public, might almost have been a phase of the Red Cross peace-time health programme. It is the policy of the Red Cross Society, where wise specialists are required, or where there is in existence an organization prepared to do special work, not to enter that field, but to help the organization already operating to do its work better. In proof of that fact the Red Cross Society has, at various times, given money grants to the Canadian Tuberculosis Association, the National Mental Hygiene Council, the Social Hygiene Council, the Ontario Medical Association and others.

Consequently, when the Canadian Dental Hygiene Council had fully matured its programme, the writer felt no hesitation in approaching the Red Cross Society and asking for financial support. The plans of

the Hygiene Council were fully explained to the executive of the Red Cross and reasons put forth why financial support should be given. Probably the most effective argument was that the final objective of all dental publicity work for the general public and the dentists themselves was the creation of public opinion which would result in the formation of a dental service, such as that recently created in Ontario, in every provincial health department in Canada. If it is necessary to have a nursing division to look after public health nursing; a sanitary division to look after sanitation, water supplies and sewage disposal; a school hygiene division to look after medical inspection of school children, and so forth, surely it is equally important to have a dental service to look after such dental work as should be supervised by such a health department.

The executive of the Red Cross was sympathetic, expressed its appreciation of the work of the Canadian Dental Hygiene Council, and unanimously approved of the grant of \$2,500 asked for. Endorsement by the Red Cross will aid materially in obtaining money from other sources, and it is confidently expected that the sum necessary to carry out the complete programme of the Hygiene Council will be obtained. We are assured, also, that the dental profession will co-operate with the Canadian Dental Hygiene Council in carrying out its programme, and will also be sympathetic towards and support the peace-time work of the Red Cross Society for "The improvement of health, the prevention of disease, and the mitigation of suffering" the world over.

TAXING TEETH.—The New York correspondent of the *Daily Mail* has forwarded to that journal the following story which certainly provides food for thought:—

"False teeth may be assessed as taxable personal property, according to the ruling of the tax assessors of Atlantic City. They assessed a set of teeth worn by Mr. William B. Riddle at £250 and levied a tax of £6.

"Mr. Riddle paid £420 for the set, which he took from his mouth during a debate on the accuracy of the assessment of his personal property. A dentist member of the tax board noted the value of the teeth and commented on it. The board decided that they were subject to tax.

"After a debate whether they should be taxed at Mr. Riddle's home or at his place of business, the board decided that he used the teeth at business as much as at home and levied the tax in Atlantic City."

We confess to never having seen a £420 set of teeth; and we should like to know how the dentist member of the tax board noted its value, and in what respect it differed from a set worth, say, half that amount. Perhaps £420 is a misprint for 420 dollars. At any rate, the capital levy is suggested, or was it an import tax under the Customs tariff, in which case the dentist member of the tax board was merely helping to protect home industry.

Oral Health



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Vol. 17

TORONTO, FEBRUARY, 1927

No. 2

EDITORIAL

The Canadian Dental Association



ELSEWHERE in this issue is published an Open Letter to the dentists of Canada from the President of the Canadian Dental Association, and a statement issued by the Secretary of the Association, outlining the salient features of the proposed change in the federal organization of the Dental Profession in Canada. One of the more important of the new features is the formation of a Board of Management, composed of representatives from each province, and organized along somewhat similar lines to the House of Delegates of the American Dental Association.

At present the C.D.A. is composed, in an executive sense, of those who may happen to be present from time to time at conventions of the Association. But the distances to travel are so great that convention meetings of the Canadian Dental Association have never been what one might designate as truly representative of the Dentists of Canada. Another important suggestion is that provincial dental bodies contribute to the funds of the Canadian Association upon a per capita

basis of fifty cents per member, thus placing the Association in a position to properly carry on its work.

These suggestions would, we believe, go far in bringing about the advantages referred to in the President's and Secretary's letters, and it is hoped by all of the officers that those desirous of maintaining a strong, healthy, representative national dental association in Canada will give unqualified support to the new plan of organization.

Four provinces have already appointed delegates. Some have appointed delegates with power to act, while others may prefer to have the whole plan submitted in detail after the first meeting of delegates, for the approval of the provincial body. The vital thing is to perfect a plan that will appeal to the provinces as being fair and practicable, and if any province then wishes to give further consideration to the complete plan, there could, of course, be no possible objection.

The important duty at the moment is for every province in the Dominion to appoint two delegates to the Canadian meeting in May, that every part of Canada may be represented, and an organization completed that may prove to be a truly national dental body giving attention to the many Federal Dental Health problems and speaking with authority upon all matters affecting, as a whole, the Dental Profession in Canada.

Dental Boards and Provincial Universities

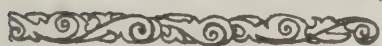
IN some of the Canadian provinces agreements have been made between the dental licensing boards and the provincial universities to fix dental standards and examine candidates for the province concerned, reporting to the Dental Board upon those who have met the requirements. The Board receives the report and issues dental licenses to successful candidates who agree to comply with the rules and regulations of the Board.

The advantages of such arrangements are that friendly co-operation is maintained between the Dental Licensing Boards and the Provincial Universities. The University assumes full responsibility for the rejection of a candidate, and in case of litigation, application by an unregistered person for legislation by way of private bill, or disciplinary action by the Board, the full force of the influence of the University is exerted in support of the Board in the administration of its public trust.

PRESSURE ANÆSTHESIA.—Instead of a piece of unvulcanized rubber in pressure anæsthesia, use a small piece of wax (made of half quantity of black wax, on which the artificial teeth are supplied, and pink paraffin); this is easily mixed, and always ready, and will work with less pressure.—*Australian Journal of Dentistry.*

ORAL HEALTH

*A JOURNAL THAT STANDS FOR THE OUNCE OF
PREVENTION AS WELL AS THE "POUND OF CURE"*



Vol. 17

TORONTO, MARCH, 1927

No. 3

Dental Metallurgy*

REGINALD V. WILLIAMS, BUFFALO.



It is presumed that most of you came to the meeting this evening to witness a demonstration of metals being melted in the air. Strange as it may seem, this performance is actually possible and is, furthermore, a commercial success. Large amounts of alloys of precious metals are being melted by this method daily, without any apparent source of heat or outward heat application.

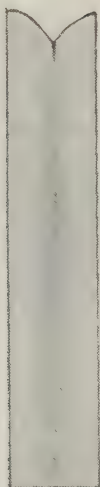
The particular apparatus which is to be demonstrated this evening is essentially a small model of the large industrial equipment. Due, however, to the low voltage input and other factors which must be considered in a converter of this type, there are certain limitations to its performance.

The principle of inductive melting of metals is the invention of Dr. Edwin F. Northrup, of Princeton, N.J. The converter and melting attachments are the result of co-operative research on the part of the Ajax Electrothermic Corporation, the Radio Engineering Department of the General Electric Co., and the Williams Gold Refining Co.¹ This converter is the first of its kind ever constructed and was designed especially for the melting and casting of dental alloys. It is capable of converting current of commercial frequency, in this particular instance, sixty cycles per second, into current of two millions of cycles or more per second. The converter is very similar to a wireless transmitter of the vacuum tube type. The principal parts are of standard radio construction. A more detailed description will follow.

An immediate demonstration of the converter might possibly cause some confusion in the minds of some in the audience, especially those not familiar with the fundamentals of wireless transmission or high frequency inductive melting.

Firstly, there should be explained the reason for this development and

*Paper delivered before the Toronto Academy of Dentistry, Physics Building, University of Toronto, February 16, 1926.



Slide 1.

Cross-section drawing showing typical occurrence in the casting of a complex gold-platinum billet. Extreme upper portion shows concave surface caused by shrinkage, also pipe below shrinkage cavity. Darkened portion, according to Mathey, area of platinum segregation.

This slide is quite old. It was made a number of years ago and has previously been published.³ It is usually shown to every audience because it covers the fundamental defects common to all castings, whether in laboratory work or in larger industrial applications. It is a rod casting which will eventually be swaged and drawn into wire. It will be noted that a number of the following photomicrographs are taken from specimens of drawn wire. This procedure has been invariably followed, because metal in that shape furnishes every opportunity for a thorough metallurgic and metallographic analysis. The cast ingot may be examined minutely under the microscope for shrinkage cavities, blow-holes, or trapped gases, also segregated metals. In this condition it can also be subjected to certain physical testing, such as hardness, either by Brinnell, Rockwell or Sclerescoper. These tests do not prohibit further swaging or drawing. After the metal has been swaged and drawn through diamond dies into accurate cross-sections, it can again be subjected to all standard physical tests and a further metallographic examination. Physical testing plainly shows WHEN metal is faulty; examination under the microscope is an aid to determining WHY it is faulty.

This rod casting shows several interesting things. Firstly, beginning at the top of the ingot there is observed a concave or V surface. This is caused by shrinkage and is always present in cast metals with the exception of certain types which expand on cooling and which are apparently not applicable to dentistry. This shrinkage factor is best controlled by trying to limit it to the feeder or top portion of the ingot.

There is also observed in this casting a small black line directly below the shrinkage cavity. This is the pipe through which gases escaped from the molten metal. The number of pipes in a casting is not necessarily limited to one; there might be more.

Another point of interest in this casting is the graphic representation of segregated platinum. This is observed as the darkened area throughout the centre. As early as 1894, Mathey clearly proved that it was impossible to obtain uniform alloys of gold and platinum in any flame type of furnace even after repeated remelting.⁴ Plant castings on hundreds of repeat tests, later verified this fact and furnished a number of striking examples.

especially its ideal application to the metals used daily in the practice of dentistry. Its continued use over a considerable period of time, and on hundreds of repeat tests, proves its value beyond all possible doubt.

In order to make the subject more clear, it will be necessary to touch briefly on the metallurgy of precious metals. This subject should be of some interest to a practising dentist, inasmuch as one-third of his total expenditure is for precious metals. It seems unfortunate that he

should be compelled to spend such large sums of money on such expensive materials, but it is something that cannot be avoided. Metal, it seems, must be the backbone of the majority of dental restorations, and under the conditions and difficulties encountered, the precious metals are the only ones available or even permissible.

The use of pure gold and a few simple gold alloys dates back to antiquity. If we can believe all that we read, Tutankamen's tomb was full of gold. There could be no resemblance, however, to any of the complex alloys used in dentistry to-day. They did not possess the knowledge necessary to make these alloys nor, of course, the equipment. As it is, the manufacturing of alloys of precious metals is just an infant industry. There is little or no literature on the subject, nor precedent by which to be guided.

The extraction of gold from the soil furnishes authors with an endless source of material for adventure and romance. In Mexican mines operating to-day, there are found chains and padlocks which held slaves working underground within a radius of a few yards until they died. Slaves were exceedingly cheap and easily replaced.

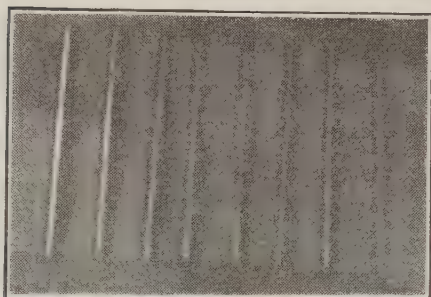
Approximately one-half of all the gold produced in the world to-day, comes from one group of mines in South Africa. The United States produces annually approximately sixty millions of dollars worth of gold. Jewellery consumes at least thirty millions, and dentistry at least twenty millions. The remainder goes into coinage and reserve.

The price of pure gold is \$20.67 per ounce. Fundamental economics

Slide 2.

Chart from Mathey showing impossibility of obtaining uniform alloys of gold and platinum even after repeated remelting.

	ALLOY	Maximum Difference in Assay Between Centre and Outside	REMARKS
		Per 1,000	
1	AU. 900 PT. 100	58.9	
2	"	30.6	HEATED IN OIL FURNACE, MELTED SEVERAL TIMES AND THOROUGHLY STIRRED
3	"	19.7	No. 2 ALLOY REMELTED.
4	"	27.2	No. 3 REMELTED IN OXY- HYDROGEN FLAME IN LIME FURNACE.



Slide 3.

Cropped gold-platinum complex alloy billets. Photograph fails to show unusually fine appearance.

This is a group of unusually fine appearing rod castings as they are actually turned out in plant production. If these billets were huge affairs, and cast from base metal with an attempt to obtain soundest possible metal, they would crop a great deal from the top, possibly as high as twenty per cent. Billets of gold alloy are subjected to the same treatment. However, one is never certain of having cropped the entire faulty structure. Pipes might not be visible to the eye, yet still be present in the metal. As a matter of practical test, one cropped rod was selected from this lot of billets and subjected to careful examination under the microscope.

calls for one fixed standard, and gold has been accepted as that standard. This fixed standard, however, has its disadvantages. There is possibly less gold produced to-day than there was fifty years ago. Modern processes and machinery might double a mine output of fifty years ago, but wages and overhead have gone up in proportion, and the



Slide 4.

Transverse view taken from top of billet after pipe structure had presumably been cropped and removed. Pipe plainly visible across entire field. Also shows typical casting structure. Magnified one hundred and twenty-five diameters.

The dark line across the entire field shows the pipe still present in the cropped billet. The suddenly chilled casting or dendritic structure is quite apparent in this photomicrograph. Upon annealing, this structure would disappear. The wire drawer, a very thorough workman, was quite surprised to know that the entire questionable area had not been removed, so he again cropped the ingot.



Slide 5.

Same view as slide three after additional cropping. Pipe is still present but much smaller. Due to annealing, casting structure has disappeared. Magnified one hundred and twenty-five diameters.

This shows the billet top after the second cropping. The pipe is still present, although much smaller. The metal was also annealed so it no longer shows the dendritic structure.

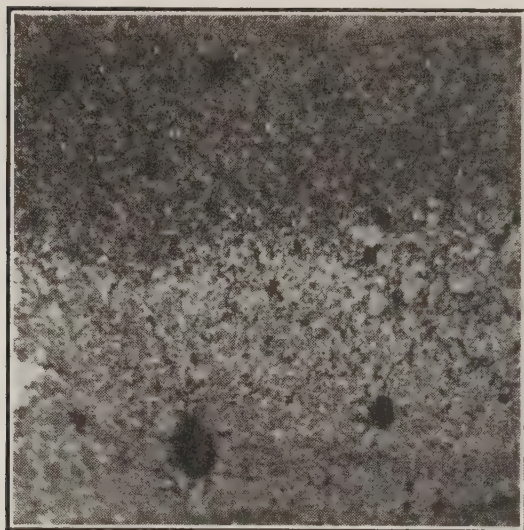
price of their product remains unchanged. A number of mines have been abandoned because there was no longer a profit in their operation. Several bills have been brought up in the United States Congress in an attempt to remedy this condition. One bill proposed the placing of a tax on all of the gold consumed in the arts, in jewellery and in dentistry, and the payment of a premium on all of the gold produced at the mines.² These bills have been defeated, however, on the theory that the Government has never yet imposed a tax on one portion of the people for payment to another portion.

The precious metal requirements in dentistry may be conveniently grouped into three distinct classes.

Firstly, the pure metals. Everyone is familiar with pure gold, foil, plate, wire and so on. They represent no especially difficult metallurgical problem. It is more a question of good chemistry and mechanical equipment.

The second group comprises the simple alloys, namely, pure gold to which has been added small amounts of copper or silver, or both metals. These metals are alloyed with gold in order to impart additional hardness and strength. Under this heading are the various plates and wires of no great spring value.

A dozen or so years ago, there appeared almost over night, in response to an urgent demand from the dental profession, dozens of gold-platinum complex alloys, to be used in the new art of casting and the comparatively new practice of orthodontia. In an attempt to get these desired yet unstandardized new properties, of physical specifications



Slide 6.

Slide 6. Shows decided platinum segregation, also blow-holes. Magnified one hundred and twenty-five diameters.

Recognized authorities have stated that platinum segregates in alloys of gold. This was taken for granted, but it was desirable to observe the appearance of the segregation under the microscope. After a great deal of effort, unquestionably authentic photomicrographs were obtained. Specimens were very carefully polished, etched and photographed. This work would again be repeated on the same specimens, and the identical structure would reappear. Work was carried out on numberless specimens taken from plant production and known from physical testing to be faulty. This slide shows typical segregation. Not only is expert knowledge of metallography necessary for the preparation of authentic photomicrographs, but considerable practice and knowledge is necessary for the proper reading and interpretation of the completed work. Remembering the following point, however, should be of considerable assistance. Considering the field as a whole at these comparatively low magnifications—namely, one hundred and twenty-five diameters—one part of the field should appear similar to any other part. It is easily observed that this field is not uniform. There is an exceedingly light area on the left. Comparison with a homogeneous alloy will show the distinction.

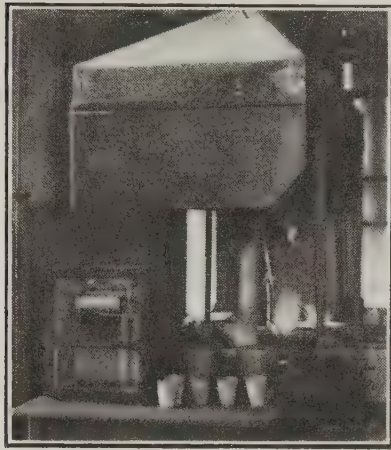
The question naturally arises, what happens to these non-uniform alloys when they are drawn into wire or rolled into plate? This is sometimes a difficult matter to accomplish, as the metal will break, flake, sliver and so on. Later slides, however, will illustrate this point.

It can also be noted from this photomicrograph that there are dark spots in the segregated area. These are blow-holes. Blow-holes and segregation frequently occur together.

In an effort to remedy these conditions, special gas furnaces were constructed and equipped with very accurate automatic recording pyrometers. Pouring temperatures for best results were very carefully determined. It was surprising to note, however, on many occasions, that the platinum did not wholly alloy with the metal, and that a great proportion still remained in the bottom of the crucible in which the alloy had been melted. Other examples showed no platinum left in the bottom of the crucible, but did show non-uniformity in the mix. Other examples showed fair uniformity, but there was no certainty of repeating the result.

Never definitely determined, to the simple alloys of group two were hurriedly added, platinum, palladium, iridium, and sometimes iron, aluminum, nickel, zinc, rhodium and tungsten. This comprises group three, the greatest problem with which the metallurgist of precious metals has to contend.

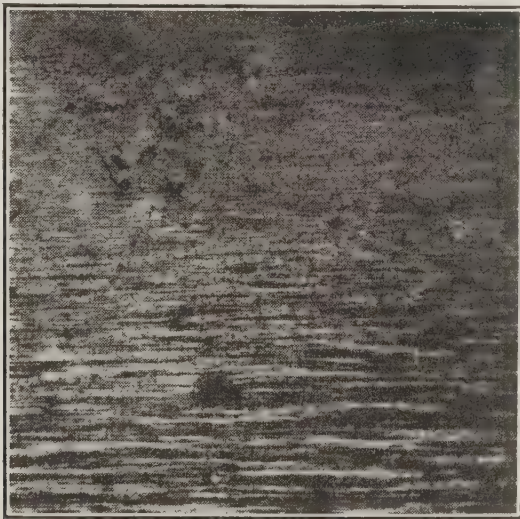
These metals are known as the hard golds, the spring golds, the



Slide 7.

Battery of gas furnaces, with automatic temperature control. This equipment was not found adequate for the making of sound uniform castings.

clasp golds, and with the exception of the simplest inlay metals, the great majority of the casting golds. Some of these golds were white, some were red, some were gray, in fact there was almost any combination of colour. These multi-coloured golds, so we read, were all "properly balanced." That expression was quite popular. They also all showed the "very minimum of shrinkage," or possibly none at all. Furthermore, they usually possessed just the proper physical character-



Slide 8.

Wire drawn from non-uniform billet. Segregation is plainly noticeable. Also shows typical drawn, cold worked or wire structure. Longitudinal view magnified one hundred and twenty-five diameters.

This is a photomicrograph of wire drawn from a non-homogeneous billet. It is easy to note the uneven appearance of the field. The wire was known to be defective. Tensile tests were exceedingly low. The microscope explained the reason for the defectiveness.



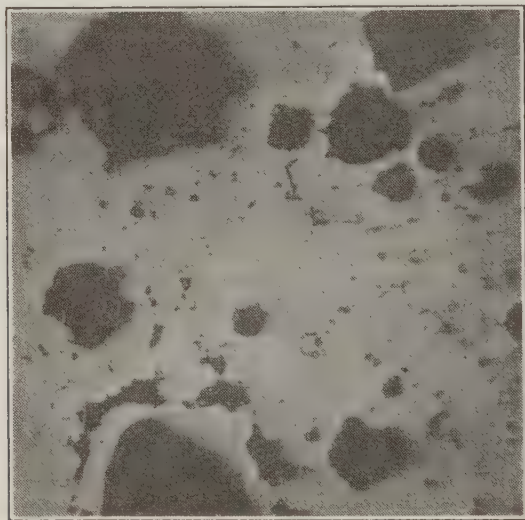
Slide 9.

Phosphorus segregation in steel. This defect caused the scrapping of large quantities of steel wire.

The problem of segregation is by no means a new one, nor does it occur exclusively in alloys of gold and platinum. This particular slide shows phosphorus segregation in steel. It was the cause of the scrapping of many tons of steel wire. It is a costly occurrence in many industries.⁵

istics for the work intended. That expression was good and broad and covered about everything.

If these alloys were in dentistry to stay, and it appeared that they were, some rather intensive research work had to be done. Thanks to

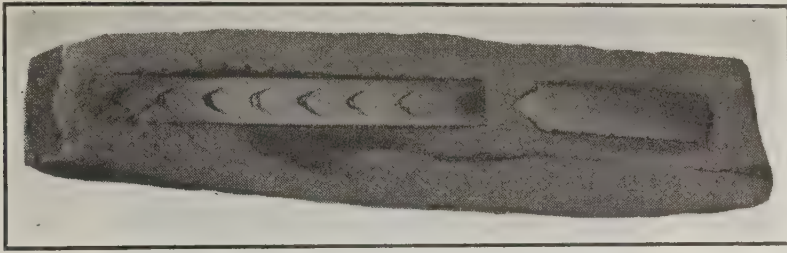


Slide 10.

Unetched metal showing blow-holes.

This slide shows the appearance of blow-holes under the microscope. The alloy is again of the complex gold-platinum series. The background is light because the metal has not been etched to bring out the crystalline structure. In looking for blow-holes, shrinkage cavities, inclusions, etc., it has been found better practice not to etch the metal. To determine segregation, the background must be etched.

This metal is no worse than many dental castings.



Slide 11.

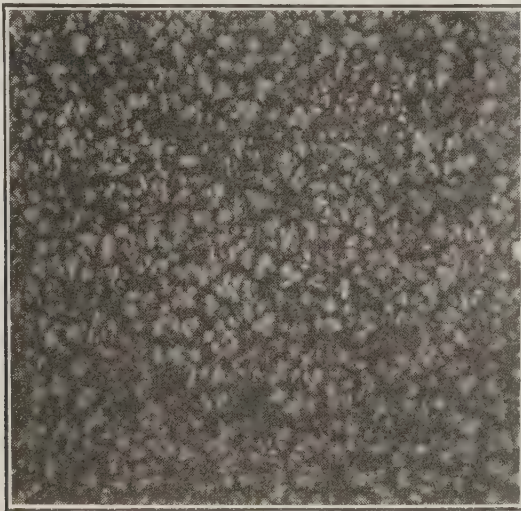
"Cuppy" wire imbedded in lead and exposed lengthwise along diameter.

This is another previously published slide, but it illustrates quite nicely another result of drawing faulty billets into wire.⁶ There is shown here a small length of wire, imbedded in a matrix of lead. It has been filed into a half section, and very carefully polished and photographed. The wire is open lengthwise along the diameter.

The exterior of this wire was perfect, yet in the testing machine it broke quite easily. One end of the wire at the point of fracture took the form of a point; the other end, the form of a cup. The reason for the peculiar fracture and lack of strength is readily seen. There are arrow-like openings in the interior of the wire extending almost to the surface on either side. The shape of the openings is due to cold work through the draw-plate. This particular kind of wire is known as "cuppy" wire.

the increasing practice of dentistry, or to the increasing knowledge on the part of the public of the value of dentistry, gold sales reached a volume which would allow for the overhead of well-equipped research laboratories.

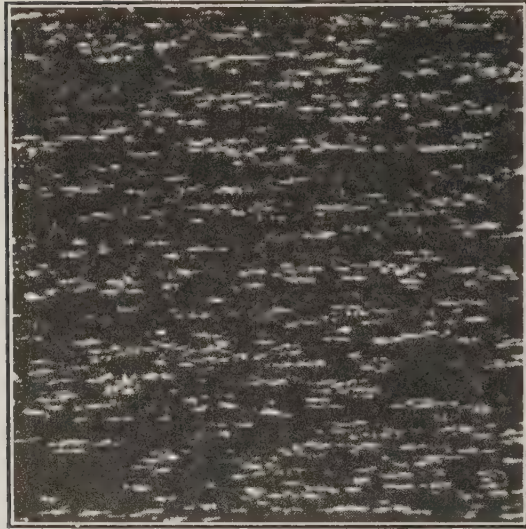
Rather coldly discussing point one previously mentioned, namely, "the alloy perfect in balance"—in spite of the difference in its complexion from dozens of its kind—this expression of balance conveys something vaguely to the mind, but what it might be is not exactly clear. It



Slide 12.

Very homogeneous and blow-hole free complex gold-platinum alloy. Magnified one hundred and twenty-five diameters.

This slide illustrates a homogeneous, uniform alloy. The billet tested perfectly, also the resulting metal drew and tested perfectly. Taken as a whole, one part of the field is similar to any other part.



Slide 13.

Faultless wire drawn from sound and uniform billet. Longitudinal view magnified one hundred and twenty-five diameters.

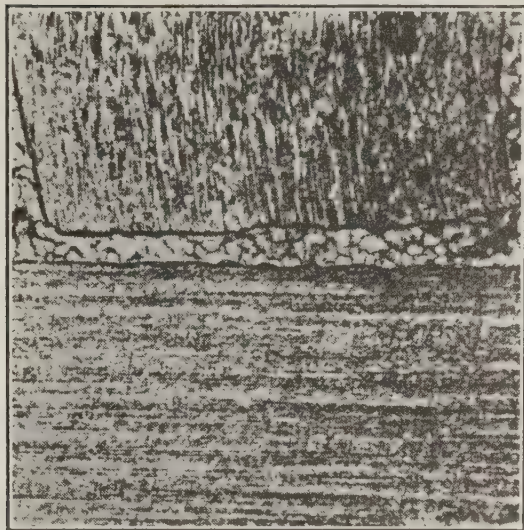
A photomicrograph of good wire taken from the previously shown billet. The rounded crystalline groups of the previous slide now have a compressed elongated appearance. This is, of course, due to cold work, or drawing.

suggests sort of an extremely intimate mixture of four, five, or six metals, in nice quiet fusion in a crucible, all suspended more or less, in perfect, peaceful, equilibrium, in spite of the fact that the specific gravity of zinc is 7, copper 9, silver 10, gold 19, and platinum 21, and in spite of the fact that the fusing points vary from 550 degrees F. to 3190 degrees F., and in many instances higher.

In discussing shrinkage, it can be stated that this problem is as old as metal itself. The shrinkage of metal when passing from a liquid to a solid state is being combatted in the base metal industries by the use of gates, hot-tops, feeders, risers, and so on. If there must be shrinkage in a body of metal, they have tried to limit it as far as possible to the feeder, hot-top or upper portion. In the particular casting work of the dentist, this portion is known as the button. Shrinkage appears to be primarily a result of gas absorption. Metals usually absorb gases in direct ratio with increasing temperatures. The volumes of gases absorbed at fixed temperatures are variable. If shrinkage is even partially governed by absorbed gases, and if the volumes of these gases are variable, so also, it appears, would be shrinkage. It is fortunate, however, that for most cast dental restorations, the error from shrinkage might be much less than the error in other parts of the preparation technique.

In reference to the statement that a metal possesses just the proper physical characteristics for the work intended,—of apparent insignificance but really of considerable importance, is the fact that identical procedure or work is never repeated.

The physical specifications usually called for in metal requirements



Slide 14.

Two pieces of high fusing wire joined together with solder. View shown is the point of juncture of one wire soldered at the end perpendicularly to the side of the other wire. In spite of the heat employed in the soldering, the cold-worked structure is plainly visible in both wires.

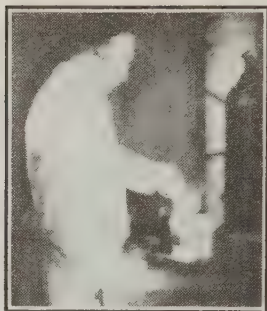
This photomicrograph is possibly of some interest. It covers a very much discussed point in prosthetic work. It has been stated that when soldering a wire clasp or attachment, the operator should not expose the wire to the flame for too great a period of time, as it reverted the structure of the metal back to the cast condition. This result never takes place in a normal soldering operation. The cold worked structure will still be plainly apparent in the wire, unless the metal has actually been melted, or exposed to red heat for much longer periods of time than would be possible in normal laboratory work.⁷

This slide shows two wires united with solder, at right angles to each other. It is easy to note the plainly defined cold worked structure. This structure, in spite of being exposed to red heat, is vastly different from cast structure.

In any soldering operation, it is highly advisable to remove the work from the flame just as soon as possible, but principally because of the fact that higher temperatures cause more blow-holes or pits in the solder. It can be stated that soldering work is very seldom entirely free from these defects.

are as follows: tensile strength, elastic limit, percentage of elongation, reduction in area, hardness, fatigue, resistance to flow, torsional qualities and a number of other tests. The instruments used to perform these tests had, in many instances, to be constructed in order to make them applicable for the testing of some of the small delicate metals used in dentistry.

Firstly, the reason for the existence of these complex alloys should be understood. A problem should not deliberately be made difficult if there is no necessity for it. The necessity, however, does exist. These additional metals are added to the alloys of group two, in order to give greater hardness, strength, to raise the fusing point and, sometimes, to give certain colours. Groups one, two and three, may be roughly classified according to definitely measurable physical characteristics, namely, hardness or strength. Hardness is the ability of a material to resist penetration. The tensile strength of a material is simply the weight necessary to break it into parts. The complex alloys are sometimes



Slide 15.

Illustrating the melting of metal in the air. The speed with which it is being melted is illustrated by the fact that the operator is holding the metal an inch or so from the molten and dripping end. This demonstration is very difficult to photograph, due to reflected light from the glowing metal.

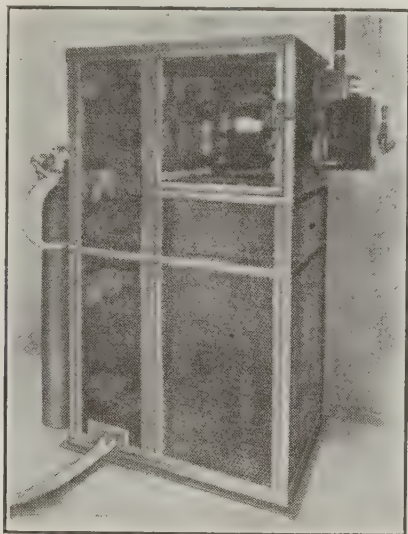
There have been mentioned some of the many and diversified problems connected with the metallurgy of precious metals. It is the office of the metallurgist to devise methods whereby the best results are accurately and, as far as possible, invariably reproduced. The method of melting and alloying metals which is to be demonstrated and rather briefly explained, is, without question, the greatest advance made in this problem in recent years. There is not sufficient time to give a detailed explanation of the Ajax-Northrup high frequency induction furnace. It does melt by induced current. The principle by which it melts is very similar to wireless or radio transmission. It is popularly known as "melting by radio." When melting by direct induction, it will melt a metal but not a non-conductor. It melts so quickly that a strip of metal may be held in the hand and melted within an inch or so of the fingers without any discomfort whatever. Temperatures may be attained in excess of five thousand degrees F.; in fact, the upper limit has never been determined. The heat is subject to perfect control. It can operate in a vacuum or in any atmosphere. The electrical resistivity of the metal is an important factor when melting by direct induction. The resistivity of platinum is extremely high, consequently it will melt almost as quickly as pure silver or copper. The system is highly recommended by the United States Mint, by the Bureau of Standards, and a number of commercial firms. This invention is new, newer even than the complex alloys, and its field for development is vast.

Due to the magnetic flux or eddy currents, there is a resulting vigorous stirring of the metal, consequently homogeneous alloys are assured.

called the "hard" golds, so by considering in a practical way, the gold restorations which must be hard or possess considerable tensile strength, the metals of group three may be partially summed up. They are the golds used in the casting of clasps, inlay abutments, three-quarter crowns, partial dentures, palatal and lingual bars, and so on. Also of great importance in this group are the clasp wires, the spring wire and the greater portion of orthodontia materials.

When referred to in terms of tensile strength in pounds per square inch, groups one, two and three are quite easily classified. Group one, or the pure metals, have a tensile strength of approximately thirty thousand pounds per square inch. Group two, or the simple alloys, average from forty to seventy thousand pounds per square inch. Group three, or the complex alloys, average from seventy thousand pounds per square inch to one hundred thousand pounds per square inch and over.

Copper greatly increases the hardness of pure gold. Smaller amounts of nickel have an even greater hardening effect. Both of these con-



Slide 16.

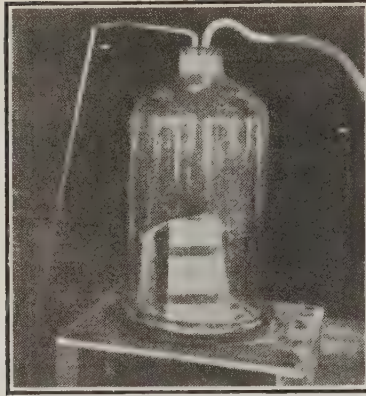
The 35 KVA converter necessary for the furnace operation. Inside the protection cage are shown the six to eight thousand volt transformer, the bank of static condensers and the mercury discharge gap.

stituents are usually found in the inexpensive clasp metals and casting golds. For high-grade metals, most of the manufacturers employ platinum as a hardener. It is known that platinum will not oxidize. It raises the fusing point and assures greater ease and safety in soldering. It promotes an inconspicuous colour. It does, however, add difficulties in the manufacturing which cannot be overlooked. The general opinion prevailing in the dental profession is that the higher is the platinum



Slide 17.

Illustrating the convenience of this equipment. The entire furnace and crucible may be lifted by hand, and the molten metal poured into the mould. The furnace is at room temperature; the metal might be over three thousand degrees F.

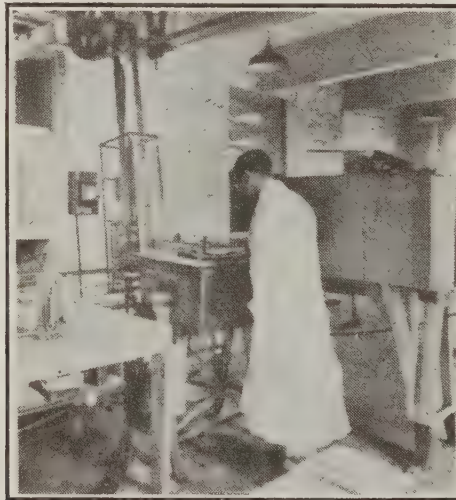


Slide 18.

The vacuum furnace for rod castings. The metal is perfectly mixed. There can be no oxidation. The upper surface of the cast ingot is convex and not concave, showing reduction of shrinkage to a minimum. The same is also true of blow-holes and pipe structure.

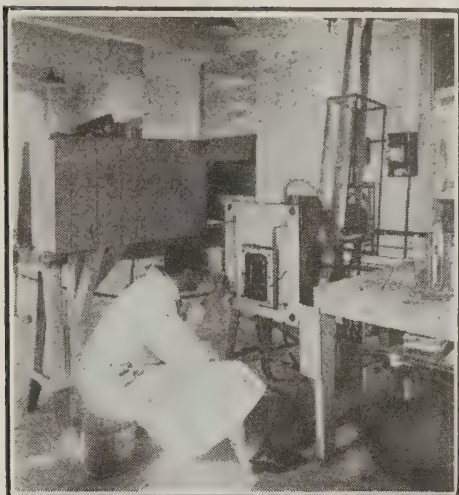
content of an alloy, the harder is the metal. This is not always true. Harder alloys may be manufactured containing much smaller quantities of nickel. This is not a statement in defence of the use of nickel. Where price is an all-important factor, nickel, of course, must be used.

The question naturally arises, when, if at all, should these ordinarily troublesome metals be used? Roughly, a distinction may be drawn as follows. If the molten metal is limited to plant casting, where they work with large volumes and have every sort of scientific control, and the metal is used by the dentist only as a wrought alloy, then these metals may be used if they impart any particularly desired property. If, how-



Slide 19.

The adoption of the same vacuum principle to flat castings in an adjustable iron mould. The metal is melted in the square-shaped evacuated tilting furnace. The operation is watched through a thick pyrex window on the top of the furnace. The glow of the molten metal in the interior furnishes perfect illumination.



Slide 20.

The evacuated furnace in a tilted or pouring position.

ever, the metal is to be remelted by the dentist, he should be safeguarded as much as possible and an allowance made for his possessing no greater than average skill with the blow-pipe.

The troubles encountered in the manufacturing of the gold-platinum complex alloys are so numerous that pages might be written on the subject. There always have been difficulties and it is quite possible that there always will be. The other industries have spent vast sums of money combatting the identical problems. Almost four hundred years ago, Benevenuto Cellini did some rather remarkable work with the precious metals. His work on casting should be of interest to everyone. He summed up the problem quite nicely when he said that the greatest enemy to sound casting was trapped gas. Its effect on "blow-holes" is probably better known than the cause. A careful compilation of data in one of the largest die casting companies in the country, showed on certain work a wastage of more than fourteen per cent. These casting failures occurred in spite of every technical device and control. It might appear from this statement that there is little likelihood of a dentist making better than four out of five perfect castings. Such a conclusion, however, is not entirely true. There are made few, if any, perfectly sound castings, entirely free from blow-holes, shrinkage cavities or other defects. However, the very nature of the work does not seem to require the utmost soundness of the metal. It would be equally wrong, however, to state that the soundest possible metal is not greatly desirable in every instance. Such cast restorations could be thinner, lighter and stronger.

Metallurgists working in a common field do not always encounter the same problems. A problem to one might not be a problem to another. In an effort to overcome difficulties, they very seldom adopt



Slide 21.

The vacuum tube converter shown in demonstration. The parts are all of standard radio construction. For convenience they are mounted in a pressed metal box.

identical procedures, and yet all might be equally successful. The method which will be demonstrated this evening has been quite successful in the solution of a number of difficulties encountered in manufacturing alloys of precious metals.

At this time acknowledgement is always made to Professor David E. Waite for the assistance received in the preparation of photomicrographs, and to the Round Table Study Club of Buffalo, N.Y., for their untiring work in the casting of test specimens.

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The Canadian Red Cross and Its Peace-Time Programme of Health Conservation



AN official statement issued in the latter part of February from the Headquarters of the Canadian Red Cross Society in Toronto, shows that since the war this organization has spent on its peace-time programme of health conservation, throughout the Dominion, a sum of seven millions of dollars.

Of this sum, which consisted of the monies available at the Armistice with the revenues accruing since that time, about one-half has been spent for the benefit of disabled ex-soldiers and their families. The other half has gone to support the peace-time services of the Red Cross, i.e., for the improvement of health, the prevention of disease, and the mitigation of suffering.

In the past year disbursements of the Society amounted to well over eight hundred thousand dollars in all parts of the Dominion, this sum including grants to Provincial Divisions, as well as expenditures made for the national activities of the central body.

Prepared by Dr. James W. Robertson, Chairman of the Central Council of the Red Cross in Canada, acting in conjunction with Dr. J. L. Biggar, Chief Commissioner, the statement deals in detail with the causes which made it imperative, at the close of the war, that Red Cross work should go on without pause; outlines the peace-time constitution of the League of Red Cross Societies, and of the Canadian Red Cross, as an integral part of the British and World Leagues; then enters into a resume of the tasks which the Red Cross has undertaken or accomplished in Canada during the past six years.

These tasks are shown to have become urgently necessary because of the revelations made during the war. Never before had such immense numbers of men been subjected to medical examination, and never had it been revealed that so large a proportion of them were in such shockingly poor physical condition. In Britain, during the last year of the war, only one in three was found to be fit for service. In Canada, of the 361,605 draftees under the Military Service Act, 181,229, or almost one-half of them, were found to be physically unfit for full service in the field.

The need for Health Reform, through education, was thus demonstrated to be as necessary as in Europe where the League of Red Cross Societies made the assertion "that a great part of the world-wide prevalence of disease and suffering is due to wide-spread ignorance and lack of application of well established facts and methods capable either of largely restricting it or preventing it altogether."

Due largely to the education carried on since the war by the Red Cross and other health agencies in Canada, many thousands of our school children have been medically and dentally examined in the past

few years. Through such examinations it has been clearly demonstrated that a very high percentage of Canadian children have defective teeth, that there is an almost constant ratio of one case of malnutrition in every three children, and a far too high proportion of children with nasal obstructions or eye defects.

With this and much other evidence to back the now strongly held belief that many of the diseases of adult life arise in early childhood and that the prevention must therefore begin during these years, the Red Cross began its health education programme with the children of Canada. Through its Junior Society, which now numbers 137,000 children, organized under the triple slogans of "Health," "Service" and "Good Citizenship," a highly constructive task has been undertaken with remarkably practical results.

It has been shown that wherever the Juniors are strong in the schools, percentages of malnutrition fall and general health standards rise, a fact which is testified to by teachers, inspectors, medical supervisors, and educational officials in many Canadian provinces.

Then, too, the Juniors are health crusaders themselves, for in the past five years they have secured medical, surgical or hospital attention for five thousand (5,000) handicapped children in all parts of the Dominion; they support, in two western provinces, Children's Hospitals which have cared for 2,500 patients and they have undertaken to provide treatment for no less than 12,645 dental cases, a large proportion of whom are in Manitoba, where the Juniors specialize in this type of health work.

The Red Cross has entered another big field of health education through their Home Nursing Classes—now Dominion-wide—for wives, mothers and girls. Although these classes were not begun until comparatively recently, over 11,000 girls and women have taken this course of useful instruction in personal, home and family hygiene. Last year there were 305 classes in all Canada, so that to date it is estimated that this rapidly extending service has assisted materially in the improvement of the daily habits of not less than 45,000 people in the Provinces of British Columbia, Alberta, Saskatchewan, Ontario, New Brunswick, Nova Scotia and Prince Edward Island, where these classes have been conducted.

Soon after the war the Red Cross, finding nowhere in Canada provision made for an adequate course in Public Health Nursing, arranged conferences with their Provincial Divisions, with University authorities, and health officials, with the result that to-day many Canadian Universities now provide such courses. Through several Red Cross scholarships to the value of \$350.00 each, further provision has been made for such nurses as may be unable to finance this course and who wish to take it.

The Red Cross, too, has financed for certain periods, in every province in Canada, the employment of Public Health Nurses, in the hope

that the people served might be taught their value and would later bear the costs of this invaluable community service. This hope has been already realized in many places.

In the past six years the Red Cross has distributed 5,873,745 pieces of health literature, all prepared under the most expert advice.

In the past six years the Red Cross has established thirty-nine Outpost Hospitals and Nursing Stations in our hinterlands in Northern Ontario, Manitoba, Saskatchewan, Alberta and New Brunswick. This was done after it had been brought to their attention that neither the districts concerned, nor the provinces of which they were a part, could afford to supply these services in outlying, unorganized, pioneering sections where they were so urgently needed. Last year 541 mothers in such districts, who must otherwise have gone without either medical or nursing care, bore their babies in the Outposts under trained assistants and not a life was lost. Altogether last year 2,138 patients spent 24,404 hospital days under the Red Cross flag in the Outposts, and only those who read the daily records of these life-saving stations can understand just what they mean to new settlers in new lands as places of succor when disease strikes or accident befalls, and as a general health measure. The districts served by an Outpost frequently extend to a radius of sixty to one hundred miles, and the work of the nurse in charge is limited only by the needs in the community in which she is placed.

The Outpost Hospital, as we have it in Canada, is the first of its kind in the world, and Dr. F. W. Routley, Director of the Ontario Division of the Red Cross, has stated since his recent return from the Headquarters of the League of Red Cross Societies in Paris, that other countries have been so impressed with the value of such a service that already Australia, Poland, Sweden, Norway and Germany are following in the path of the Canadian Red Cross in the establishment of Nursing Outpost Stations.

Another unique contribution of the Red Cross is the humanitarian service now supplied in the Seaport Nurseries in Saint John, Quebec and Halifax. Here the Red Cross co-operates with the Immigration and Health authorities to welcome, refresh and speed on their way the mothers and children among incoming immigrants. A friendly follow-up health card is filled in at the Nurseries for each family. Later these are forwarded to points of destination of the immigrants, where these strangers are again welcomed by the Red Cross, or other agency, and are extended all information regarding what to do or to whom to apply in case of accident, illness or distress.

At all times the Red Cross is pre-eminently the organization to which every one looks to carry out the universal desire to help in times of disaster. By special arrangements with the Department of National Defence, certain supplies are instantly released to the Society, if need arises, and immediate action is taken in the affected locality through the

Divisional Headquarters of the Red Cross. In the past six years this organization in Canada has dealt with districts swept by forest fires, with villages destroyed by conflagrations, with countrysides ravaged by storms and with others where severe distress has arisen through drought.

Then, through its international affiliations, it was enabled to assist materially in the collection and forwarding of supplies or other relief after the great earthquake in Japan, a form of devastating catastrophe which Canada herself fortunately has never experienced.

Work of the Red Cross for ex-soldiers has consisted largely in supplementing and co-operating with governmental agencies in securing more adequate provision for all who suffered damage in the service of their country. Such work has been and is being quietly carried out all over Canada, and will be for many years to come. The various Provincial Divisions of the Red Cross or Branches provide many comforts and services in addition to those from official quarters. Necessities for dependents of soldiers are supplied, regular visiting of soldier patients is done; in several provinces Convalescent Homes have been established for ex-soldiers, and in others sheltered occupations for partially disabled men have been initiated.

In its concluding paragraphs the statement points out that there has been no rivalry between the Red Cross and other voluntary health bodies in Canada, but rather the most whole-hearted co-operation in undertaking the common tasks. In some cases the Red Cross has given grants of money to other organizations with which to carry out specialized health work, but in all cases every effort has been made to avoid overlapping. The danger, however, is shown to be not one of doing too much but of doing too little, if the peace-time objectives of the Red Cross are to be achieved. Health services such as have been and are being supplied are necessarily costly and health education is a slow process, but it is made abundantly clear that to leave such tasks as have been undertaken, undone or unfinished, is the real national extravagance as "the Red Cross can do more for the country in peace than it was able to accomplish in war."

Some Chronic Enlargements of the Jaws*

BY E. C. HUGHES, F.R.C.S., ENG.



WISH first of all to thank your Secretary for doing me the honour of inviting me to address you to-night, and to thank you for coming to listen to me. I must confess that I stand before you with considerable diffidence to discuss a subject which is a part of your specialty and with which you are far more conversant than I. I take courage, however, from the fact that my dental

Paper read at a meeting of the Metropolitan Branch, held at 23, Russell Square, London, W.C.1., on November 11, 1926, and published in *British Dental Journal*.

colleagues at Guy's Hospital send me cases, and I propose to discuss some of those which appear to me to be of interest or to be difficult of treatment.

I have recently had under my care two cases of osteomyelitis of the mandible in children of about four years of age, with resulting necrosis.

I wish to lay emphasis on the fact that sepsis of the jaws, though theoretically possible as a result of blood-borne infection, is practically always the result of oral sepsis, the infection reaching the bone either by way of a tooth, or by the gum.

It is well known that necrosis of the mandible is far more common than that of the maxilla, due in part to the greater amount of compact bone in the former, and its smaller blood-supply, and in part to the less efficient drainage of mandibular infections. The necrosis is the result of the inflammation of the bone, which dies because its blood-supply is cut off. It is exactly the same disease which the surgeon meets with in the long bones of the extremities, and which he treats by immediate operation, the interior of the bone being laid widely open to the limits of the infection. In this way adequate drainage is obtained.

In the same way in the jaw, and particularly in children, the treatment should be operative and not expectant. Expectant treatment, i.e., masterly inactivity in these cases of acute osteomyelitis of the jaw, may be followed by very serious sequelæ, e.g., prolonged suppuration with disfiguring sinuses and scars, loss of the permanent teeth, spontaneous fracture of the jaw with resulting permanent deformity, etc. Unfortunately, these cases in children are only too often dealt with by the parents by prolonged poulticing, and only arrive late under the care of the dentist, by which time great damage may have been done. Such cases may require many months of careful treatment to reach a satisfactory result.

The first case is that of a girl, aged 5, who was admitted with the following history: Two months earlier the right side of jaw and face had become swollen, with a moderate amount of pain; poultices had been applied but had had no other effect than to abolish the pain. When first seen the right side of the face was very swollen, the swelling reaching up to and marking out accurately the temporal fossa; there were two areas of fluctuation above and below the zygoma. The point of the chin deviated to the right, i.e., it was no longer in the mid-line, a point which was confirmed by examining the articulation of the incisor teeth. The mouth was easily and painlessly opened, i.e., there was no trismus; in the sulcus outside the temporary molars was a sinus, from which granulation tissue protruded and along which a probe could be passed to impinge upon the bare bone. This case led to a great deal of discussion as to the pathology of the condition, some advancing the view that it was a case of sarcoma of the mandible. The points in favour of this diagnosis were the great extent of the swelling, considerably beyond the limits of the mandible, the painlessness of the condition,

and the absence of trismus and febrile symptoms. Exploration showed it to be a widespread necrosis of the angle and ascending ramus, with two large sequestra which were removed through the sinus in the mouth. The important feature of this case is the deviation of the mandible to the side of the swelling, and is due to a pathological fracture at the site of the extensive necrosis.

Mr. Kelsey Fry has made a splint to prevent any further deviation and to correct the deviation which has already taken place.

At the present time, some five months after the onset of the disease, the child has still a swollen face and a sinus in the mouth, and is wearing the splint; and she will require supervision for some months before she can be considered cured.

The second case is that of a boy, aged 9. I met him first some four years ago, when he was admitted with a very swollen face and necrosis of the angle and ascending ramus, his condition indeed being very similar to the case I have already described. I removed sequestra from time to time.

In dealing with these cases I have obtained the greatest help from stereoscopic radiograms, which show the position, number, size and shape of the sequestra. It is tempting to curette these sinuses, but I am sure that it is a wrong practice to do so, for living cancellous bone may be interfered with, and there is a strong prospect of spreading the infection to unaffected bone. The utmost the operation must effect is the removal of the dead bone. In this case the mandible eventually healed, but the boy is now, four years later, left with a permanently swollen right side of the face, the jaw swung to the right, and practically no movement in the right temporo-mandibular joint. I have recently attempted to increase the range of his jaw movements. After resecting the condylar process of his mandible, I found that I got no improvement, and it was not until I resected condylar and coronoid processes and a portion of the ascending ramus that I got much movement; and even now I have not removed enough. In such cases the ascending ramus is firmly bound down by altered muscles, especially the temporal, into which the inflammation spreads during the long process of the original inflammation.

It is well known that the lower jaw regenerates well in children, but during this process the greatest care must be taken to secure the proper articulation of the teeth.

These two cases show how serious a neglected osteomyelitis of the jaw may be, the prolonged invalidism, the many operations for removal of sequestra, the liability to spontaneous fracture, and some permanent disfigurement and disability. Adequate treatment at the onset of the infection, i.e., early extraction to provide an exit for the inflammatory products, will prevent the spread of inflammation into the interior of the bone.

I propose to pass from these relatively uncommon cases of extensive

necrosis of the mandible to the very common condition of expansion of the jaws by dental and dentigerous cysts. The clinical features of these two very similar types of cyst are so well known that I shall not waste time in describing them in detail. They present almost exactly the same signs and symptoms and are differentiated:—

(1) By the absence of a permanent tooth in the case of the dentigerous cyst, though it must be remembered that it may arise in connection with a supernumerary tooth, and very rarely with a temporary one, while in the case of the dental cyst there may be obvious dental caries, or the jaws may be edentulous, with a history of former dental sepsis.

(2) By the x-ray examination, which shows a misplaced or deformed unerupted tooth in the dentigerous cyst, while in the dental cyst it shows an erupted tooth with its root in the cyst, or the root only, or the complete absence of the tooth. Mr. Worth has given me radiographs illustrating these points, and has pointed out to me great similarity in radiographs of dental cysts and myelomata, the latter showing a haziness of the affected area and a less definite and regular contour.

Inflammation and its sequelæ are the most common complications of these cysts, and, were it not for this, and for the tendency to increase in size and to produce deformity, there would be no reason to interfere with them. Once infection has occurred, and the cyst has discharged into the mouth, a sinus remains discharging foul-smelling, evil-tasting material.

There are only two common causes of chronic sinus formation of the alveolar margin, the infected cyst being one, and necrosis of the alveolar bone the other. I have seen a case of rapidly-spreading carcinoma develop immediately after surgical interference with a long-standing sinus due to a dentigerous cyst.

The differential diagnosis of these cysts presents very little difficulty, the only likely error being to confuse a dental cyst with a myeloma of the alveolar margin, which is still covered by unaltered mucous membrane, and it may be that the diagnosis will not be made clear without an incision.

Clinically, an oval, smooth hyperostosis of the alveolar margin may be very similar to a cyst, but the radiograph at once determines the point.

A chronic abscess is said to be one of the conditions to be distinguished from a cyst, but in reality a chronic abscess in the alveolar bone and its neighbourhood does not occur, the condition being one of the two cysts, either with or without infection.

I now propose to discuss the question of treatment of these cysts.

There is no difficulty about the small cysts; the mucous membrane is reflected, the outer bony or membranous wall is removed, the contents of the cyst evacuated and the epithelial lining removed, the retained tooth removed in the case of a dentigerous cyst, or the infected

root or tooth, if a dental cyst, and the mucous membrane allowed to fall back into position. Antiseptic applications are continued until healing is complete.

Let us now consider a larger cyst in the lower canine region, which has extended back and involved the bicuspid area; here the same treatment is followed out. The mental nerve in these cases is displaced backwards as the cyst enlarges, and is unlikely to be damaged if due care is taken in the posterior part of the operative area. At the end of the operation a considerable area of the outer surface of the inner table of the jaw will be bared, and healing takes place slowly, perhaps requiring three or four months. An immediate epithelial inlay, as practised by Mr. Kelsey Fry, produced complete healing within a fortnight. There is an alternative method of treatment of which I have no experience, and that is to leave that part of the epithelial lining of the cyst which is applied to the inner table.

There is another type of cyst occurring in this region which I call the dissecting dental or dentigerous cyst, for it travels from the canine region across the mid-line, hollowing and expanding the bone as it advances. In the three or four cases of this type with which I have had to deal, the affected area has extended from molar region to molar region across the mid-line.

The first and most instructive case of this type was under the care of Mr. Dowsett; a young woman, aged 23, consulted him because she noticed that the crowns of her lower teeth were becoming displaced, being rotated inwards towards the mouth. On examination the entire body of the mandible was found to be expanded, chiefly at the expense of the outer table, and there were three soft areas where the overlying bone had been absorbed. There were two similar soft areas on the inner side. From the clinical and x-ray appearance I thought I was dealing with a multilocular cystic disease, but examination of the material removed showed it to be a dental cyst.

Mr. Dowsett and I operated on this case, removing the whole of the outer table of the horizontal ramus, the epithelial lining, and the teeth. As the last tooth, one of the left molars, was being removed, the jaw, weakened by the atrophy produced by the disease and by the extensive removal of the outer table, began to bend ominously, and it was decided to leave this tooth rather than run the risk of fracturing the jaw. Mr. Kelsey Fry was responsible for the greater part of the after-treatment, the most important part of which was the preservation of the sulcus between jaw and cheek. The final result was very satisfactory. It would have hastened the healing process to have done an immediate epithelial inlay.

In another case of this type, under the care of Mr. Doubleday, Mr. Worth took a radiograph at the patient's first visit, when a lower bicuspid was removed, and again a year later at her second visit. In the twelve months between her two visits an extensive dissecting dental cyst from molar region to molar region had developed.

The most difficult cyst of all, from the point of view of treatment, is the large cyst in the canine fossa, which, while causing an interior projection from the fossa, is for the most part contained within the superior maxilla.

The removal of this cyst leaves a large cavity, surrounded by bony unyielding walls, and, unless great care is taken in the after-treatment, a sinus opening on the canine fossa is very liable to result. The antrum is frequently displaced upwards and backwards by a large cyst and never comes into the operation area; but care must be exercised, for sometimes the antrum is not displaced but is distorted by the cyst projecting into it. Careless operating in such a case may open and infect the antrum.

The difficulty in these cases lies in the huge cavity remaining after the removal of the cyst, and can be dealt with in various ways. The cavity can be at once epithelialized by a large epithelial inlay, but this means a permanent cavity in connection with the mouth which will thereafter require careful cleansing, and possibly some apparatus to prevent facial deformity. Mr. Kelsey Fry fills the cavity with a dental composition cast, and week by week diminishes its size, until at the end of a year the cavity has become obliterated. My own practice has been to rely on packing of the cavity and syringing, but I shall in the future adopt Mr. Fry's method. But, however treated, there is a very long period of time during which attention must be paid to the cavity, and, if an epithelial inlay has been used, there is an accessory cavity which will always want attention.

Finally, I come to the cysts of the angle of the jaw and ascending ramus. These may be so big as to cause a facial deformity, the first case I saw being sent to me as a case of parotid tumour; others I have seen have had a sinus discharging offensive material through the molar area. In one case the sinus was on the cheek in front of the insertion of the masseter muscle.

Treatment of these cases by an incision within the mouth is unsatisfactory; it is difficult to get adequate exposure and to remove the epithelial lining of the cyst, and the after-treatment is very prolonged. I treat these cases by an external incision in the submaxillary region; this incision does not at once penetrate the platysma; the skin-flap is dissected up to the level of the inferior margin of the mandible, and then the platysma is cut through. By working in this way the subsequent scar is hidden under the jaw, and the cervical branch of the facial nerve is avoided. The masseter is elevated from its bony insertion into the angle of the mandible, and the whole of the ascending ramus to the level of the sigmoid notch is exposed. The outer table of the bone is removed, the epithelial lining of the cyst removed, and the masseter is then allowed to fall back into position, the platysma is sutured, and finally the skin incision is closed. Healing takes place at once, and the patient is spared the prolonged after-treatment which must follow operation from within the mouth.

The Casting Process



FOR many years immediately preceding 1907 American dental art had progressed and developed rapidly and was recognized the world over as being far superior to the dental art of any other nation.

Gold and vulcanite denture work, fixed and removable bridgework, and single crown restorations of all types had evolved from a bewildering and entangling mass of empirical details to an almost standardized technique.

Up to this epochal time nearly every dentist did all of his prosthetic work himself, and a large majority of those who did it at all did it well. All were eager to learn the latest methods, all were enthusiastic over the possibilities of dental art, and all put forth every effort in and towards the development of higher ideals with a view to ultimately attaining to a standardization of technique which would insure the highest possible achievements.

Those who had built upon high ideals and who had succeeded in acquiring average or more than average skill in the art of restoring the crowns of natural teeth as single units, and of replacing missing teeth by any of the *then* modern methods, looked upon their achievements with pride and satisfaction. They had become skilled in the manipulation of metals and in the art of soldering. They were keeping abreast of the times and doing good work, and they knew it, and, hence, they were justified, to a degree at least, in indulging a feeling of placid, but ever alert, contentment.

And then came the advent and introduction of the *casting process*, a process at first to be applied mainly to the filling of teeth, and more particularly to large restorations, but a process destined to completely revolutionize the whole field of dental art.

The dental world was startled—electrified—and almost overnight the practice of operative dentistry was completely revolutionized, and a new dental art was born.

In a short space of time former technical procedures became obsolete and were replaced by new ones; the demand for gold foil dropped about 90 per cent. from the previously normal, and electric and automatic mallets, and gold pluggers and plugger points became almost *dead stock*, and even amalgam alloys became less popular and less saleable. Gold inlays had come into general use for filling all classes and sizes of cavities, *excepting very small ones*, and this practice has continued and grown each day and each year ever since.

There still is, and perhaps always will be, a place for gold foil fillings—such as small cavities in the proximal surfaces of the anterior teeth, small occlusal cavities in the bicuspid and molars, and gingival

cavities in all teeth; and there is also a place for amalgam, for the silicates, and for ordinary cement. And yet, when the restoration of normal tooth form, or contour, and of contact and occlusion is demanded, the cast gold inlay undoubtedly affords the easiest, best, most generally applicable, and more or less permanent means of restoration.

In addition to the mechanical or physical advantages afforded, may also be computed the very great relief from discomfort and nerve strain afforded to the patient, and the saving of time and nervous energy to the dentist. These latter features are vital and humane issues, and are wondrously helpful to both patient and dentist.

If a full measure of advantages is to obtain from the use of the gold inlay, however, it must be remembered that this is not a slipshod nor lazy man's method, and that the same painstaking care and the same exactness of detail must be observed in cavity preparations, in making the wax patterns, and in all of the details of investing, wax elimination, casting, finishing and mounting that are demanded for successfully placing foil gold or any other form of restoration.

With the development of the cast gold inlay many slight variations of technique have been evolved, and some question as to the relative advantages of "hard" and "soft" gold has arisen, but, singular as it may seem, no great or striking improvements over the original technique have been made up to date.

The variations in technique have been largely those of refinement and of adaptability to the personal equation, but, taking these into account, the possibilities are no greater, and the average results no better, on the whole, than they were at the time of the original introduction.

The question of the relative advantages of "hard" and "soft" gold has been, and still is, an important one.

Clinical observations and experience, however, seem to prove conclusively that the best and most uniform results are to obtain from the use of good, new, clean 22-carat gold in all cases.

This alloy is soft enough to cast to fine marginal and surface adaptation, will permanently withstand occlusal stress, and will wear down more or less uniformly with tooth structure without producing trauma and without "turning up" along the margins.

Pure gold is too soft to "stand up" under heavy continued occlusal stress, and hence is likely to *turn up* around occlusal margins, while "hard" gold alloys, as a rule, do not cast to the same smoothness of surface that 22-carat gold does and do not wear down uniformly with tooth structure. Such alloys are, therefore, more likely to produce trauma, and should be used only in special cases where for some particular reason hardness is demanded.

Whether the filling of teeth with cast gold inlays is an operative or a prosthetic procedure has been the subject of some discussion among teachers. It is, of course, apparent that cavity preparation, the making

of the wax pattern, and the mounting of the finished inlay belongs to the field of operative dentistry, and equally apparent that investing the wax pattern, wax elimination and casting are prosthetic procedures. The building of cast inlays, therefore, belongs to both departments of dentistry, and quite happily blends both into the broad field of *dental art*, a field which is destined to become a specialty within itself in the not distant future.

With the original introduction of the casting process, as applied to the making of inlays, came also the modest statement that the same process was equally applicable to larger castings, and this statement was followed by the prophesy that the possibilities and the field of usefulness were practically unlimited. What a vision, and how true those words ring to-day!

Immediately following the successful application of the casting process to the making of inlays came its application to the building of all types of artificial crowns, where rolled gold, or platinum plate, had been used previously. This was followed by its application to the construction of pontics for bridgework, and later to small fixed and removable bridges, in sections, and to partial dentures with and without clasps, cast all in one piece, and finally to the successful casting of full dentures of any size.

PARTIAL DENTURES.

The casting of partial dentures has now been developed to a point where the use of dies and counter dies, rolled gold plate, and swaging, have been almost entirely abandoned, and to a point where successful castings and an accuracy of adaptation heretofore impossible, are but a matter of *careful* and *exact* technique.

The successful casting of large pieces, however, will depend entirely upon two factors: first, upon *careful* and *exact technique* from the taking of the impression to the finished casting, and, second, upon the adaptability of the alloy used to the purposes and requirements of each case.

If these two unvaryingly important features are observed religiously, one-piece castings of any size or shape may be cast successfully. The possibility of failure may be eliminated entirely and an accuracy of adaptation, or *fit*, which precludes any relationship to "*regulating appliances*" may be obtained in all cases.

FULL DENTURES.

By means of the same careful technique, together with the use of an alloy especially adapted to the purpose, full dentures of any size may also be cast of any desired thickness or thinness, and with a degree of accuracy of adaptation almost unbelievable.

Until recently, accuracy of adaptation in cast full dentures has not

always been possible. This might have been due to a molecular change in the alloy itself, which took place in cooling after casting, and which resulted in warpage, or to the pressure of base metals in the alloy.

The former possible cause of failure has been overcome entirely by the use of the more modern high heat investment compounds, and the latter has been eliminated by the more scientific compounding of the alloys used for this special purpose.

The presence of base metals in a casting alloy, and their subsequent volatilization under the influence of the high degree of heat necessary to bring the alloy to the state of fluidity before casting, might quite easily account for pits, or for porosity in a thin casting, and such pits or porosity would, of course, permit of leakage of air, and destroy adhesion in full upper castings.

CASTING MACHINES.

While *pressure* and *vacuum* casting machines may be used successfully in small castings, clinical experience has proven more or less conclusively that the best results in large castings obtain from the use of the centrifugal machines.

The successful casting of large pieces, however, is undoubtedly destined to become a *laboratory proposition* for the reason that few dentists of to-day have the space, facilities or equipment necessary to the requirements of this work.

It is, therefore, becoming more and more obvious that the dentists and the dental laboratory must get into closer touch, one with the other, if the highest achievements in dental art are to obtain.

At the present time most all of the high-grade dental laboratories have specially trained technicians and are well equipped to do this class of work successfully.

While gold and base metal alloy inlays and even larger castings may have been made successfully prior to 1907, the dental world knew nothing about such efforts or achievements. Hence, as we pause and look back over the years intervening between then and now, and observe the wonderful progress made in the field of dental art during this period, let us reflect, and let us be unselfish, fair and honest, and give credit where credit is due. And, lest we forget, let us pay just, deserving and timely tribute to the genius of the man who made possible all that has been achieved and all that is to follow.

Irrespective of human frailties and human selfishness, of personal opinions and personal prejudices, in the end Truth will prevail, and, hence, if truthfully written, the pages of dental history must and will record the name of William H. Taggart as the Father of Modern Dental Art.—*Editorial in Dental Craftsman.*

Eighteenth Annual Report of Chief Medical Officer of the Board of Education, England



THE eighteenth Annual Report of Sir George Newman, Chief Medical Officer of the Board of Education, deals exclusively with the measures taken to detect, to care for, and to prevent disease among children attending elementary and secondary schools in this country.

There is evidence of a general improvement in child health, and in the opinion of Sir George Newman the child who is leaving school at 14 is better physically in every way than the "leaver" of twenty years ago.

One broad fact, however, is disappointing and foreboding. Year by year there is a steady and undiminishing stream of defect or physical impairment of those who enter the schools at five years of age, and there is also a steady burden of disease in older children, apparently never lessening, which requires medical or surgical treatment. Why, after twenty years of medical inspection and treatment, is there not more sign of reduction and improvement?

The report gives four reasons, as follows:—

HEREDITY AND ENVIRONMENT.

(1) First, there are the biological laws of heredity and the influence of the environment upon the individual. The children coming to school to-day in their fifth year are in the main the offspring of six generations of town dwellers. They bear in their bodies the indelible mark of the race from which they spring. . . . We are only slowly struggling out of the results of the industrial revolution, and much of our present urban environment, insanitation, and unwholesome sunless home life is a continuance of the conditions of that revolution.

OUR CIVILIZATION.

(2) Then there is our civilization. We save and keep alive and rear the weakly infant, and it is right we should do so. We have at last learned that much wisdom, but we have not yet learned exactly how, and always, we can protect this child from impairment, infection, and the strains of its environment. . . . All too often we are trying to rear a healthy race which has been born in slums, and nurture it without the necessary amenities of favourable home surroundings. It is not correct to say it cannot be done, for it is being done; but it is difficult to do it. For, in addition to a lack of house accommodation, we have to reacquire the supreme arts of maternity and domestic nurture.

Our industrial success of a century and more is being paid for in

some degree by loss of humanity. The population has grown by leaps and bounds, beyond the wildest dreams of the early Victorians, but the island remains the same size and we are not self-supporting. The struggle thus becomes keener, the interdependence on other nations greater.

CUSTOMS THAT FAVOUR DENTAL DECAY.

Even our developing comforts bring disadvantage; our food and eating customs are favourable to dental decay; our educational methods appear to create their own problems. We have less physical stamina than our forefathers, because our ways of life are "softening" in their effect. When an animal is placed in circumstances which make insistent demands on its natural instincts and faculties, there is development; when civilization reduces the demand for resource there is less supply. Necessity is still the mother of invention. Teeth and eyes seem to have a lower survival value than formerly. . . .

DISEASE TREATED BUT NOT SUFFICIENTLY PREVENTED.

(3) Thirdly, through the existence of the school medical service, there is more disease being treated, but not more disease.

(4) Fourthly, we treat disease, but do not sufficiently prevent it. This is partly due to the "insecure, partial, and inexact" state of medical knowledge; but more largely to incompleteness in organization. For children between the ages of one year and four years there is but little provision, and thus the seeds of later disease are sown. There will soon come a time when each local authority will have to consider "the inexpediency . . . of withholding from little children the medical or surgical treatment of which they so urgently stand in need."

DENTAL CARIES AMONG INFANTS.

In the forefront of the elementary school medical problems, Sir George Newman places the serious degree of physical defect of children on their first admission. Some of the grosser forms of disease among these very young children are diminishing, but less obvious and not less important types are being revealed. For instance, fourteen per cent. of the infants arrive at school with extensive dental caries.

SITUATION IMPROVING.

Yet there is ground for believing that the situation is improving. In 1925, 2,500,000 children were subjected to direct medical inspection, 1,000,000 defects were treated, and 750,000 children received dental treatment. Since 1907 the London school child has increased in weight and height, as, broadly speaking, has the provincial child.

DENTAL INSPECTIONS AND TREATMENTS.

The number of dental inspections and treatments was considerably more than in 1924, as the following table shows:—

	1924	1925
Dental inspections	1,766,325	2,038,988
Dental treatments	654,365	768,146

STAFF OF 584 DENTISTS.

The staff of the service now totals 1,140 school medical officers, 768 specialists, 584 dentists, and 4,520 nurses. Following is a comparison between the cost of the service in 1912-13 and its cost last year:—

1912-13	£ 285,993
1924-25	1,300,347

Last year's expenditure is about 2.25 per cent. of the total cost of public education (£57,500,000), or £2 5s. 2d. out of every £100 spent by local authorities on elementary education—"not a high premium," says Sir George Newman, "for the health insurance of the future citizen."

The Value of Co-Operation



THE following paragraphs appeared under the caption "Competition—Co-operation—Consolidation," and were written by a business man. The truths expressed may be applied with great advantage to a profession—why not apply them to Dentistry?

"Competition within certain limits is stimulating and healthful, but its usefulness is slight when compared with co-operation. Co-operation might be defined as each working for all and all for each and the cost being distributed over the whole. This reduces to a minimum the cost of necessary things which are useful to all.

"In the matter of gathering information, co-operation should be the aim, but in the use to which this information may be put, competition will develop more ways to use it.

"There are many things now done individually which might be done by co-operation, if we could only bring ourselves to believe that our competitor is as honest and trustworthy as ourselves. To be sure, it is prudent to so construct your plan of co-operation as to make it very difficult for any individual to take undue advantage in the working out of the plan, and, further, there should be penalties for violations of the spirit and letter of the regulations laid down for governing the operation of the plan."

Address at the Opening of the Eleventh Session of the Dental Board of the United Kingdom

BY THE CHAIRMAN, THE RIGHT HON. SIR FRANCIS DYKE
ACLAND, BART.

MY first task is the pleasant one of welcoming back Mr. Ackland, after an absence of nearly twelve months. We are all pleased that he has recovered so well from his serious operation, and we hope that he is now completely restored to health. We have been ill able to dispense with the ripe judgment which he brings to his work.

The Board will also note with pleasure that, at the close of the recent International Dental Congress, the University of Pennsylvania conferred honorary degrees upon Dr. Guy, a member of the Board, and upon Professor Gilmour, whose services, while a member of the Board, we recall with gratitude. I feel sure that both were most worthy representatives of the British dental profession and Association at the Congress, and am glad to notice that the dry climate has not affected Dr. Guy's health.

THE NEW SCHEME OF DENTAL BENEFIT.

An important event has marked the period since I last addressed the Board—the universal adoption of dental treatment as an “additional benefit” under the National Health Insurance Act, accompanied by a new scale and conditions of service. This will, undoubtedly, mark a very great advance towards the improvement of the health of our nation, if the scheme is properly utilized. In spite of the work of the Dental Benefit Joint Committee, careful and admirable as, in my judgment, it has been, it will take time for the new system to settle down into good working order. I have no doubt that the dental profession will endeavour to work under the scheme with loyalty to it, and will even welcome the assistance of the regional dental officers in deciding questions which must needs arise. But on occasions of this sort I cannot help wishing that there were a higher standard of general education among a greater proportion of our people, so that they might be more ready to utilize fully and properly the skilled services which are now at their disposal. I realize also that, even if all the schemes of our education, health and insurance authorities work as well in practice as they are meant to work on paper, their best efforts are liable to be undermined during the ages 14 to 16, between the times when the good habits of school days are apt to cease, and when employment within the sphere of Health Insurance begins. I believe that the Board might usefully devote a considerable amount of its propaganda work

to impressing upon juveniles at this very important period of their lives the importance of care for their teeth, and to explain to insured persons, even more than we have hitherto done, the new duties and opportunities which the extension of dental benefit presents to them.

RESEARCH WORK OF MRS. MELLANBY AND MR. PATTISON.

Though I have not hitherto referred to specific research work which the Board has assisted, I think it right now to call attention to the work which Mrs. Mellanby and Mr. C. Lee Pattison have been recently carrying out with regard to the diets of children. We have been kept in touch, from time to time, with Mrs. Mellanby's previous work upon animals, and it is extremely interesting to note that its results are confirmed by the more recent investigation upon children. It would not become me, as a layman, to attempt to summarize or to assess the value of the conclusions which have been reached, but I feel sure that the concluding sentence of an appreciative article which I find in the *British Dental Journal* is in no way an over-statement of their importance. It is there stated that the investigations have added a new chapter to dental pathology, and the hope is expressed that they will provide a new and potent weapon to preventive dentistry. Certainly, if the work is sound, and the conclusions drawn from it are accurate (and this, I believe, to be the case), affection for theories necessarily based on less thorough research ought not to stand in the way of the translation of the new knowledge into living doctrine and practice.

I am very glad that the Dental Board, side by side with the Medical Research Council, have been able to provide the means which enabled this very valuable work to be carried out.

BURSARS AND BURSARIES.

I have referred in previous addresses to the assistance which the Board is giving by bursaries to persons desiring to become dentists. I have recently examined the replies which have been received to an inquiry as to how those who have been assisted have fared since their qualification.

Not all of the 176 to whom we wrote have had the courtesy to reply (and this I regret), but we have answers from 150 of them, which show that eighty are in practice on their own account, twenty-two hold public appointments, and thirty-four are working as assistants. We have heard of only six cases in which students have been unable to get into satisfactory practice within six months of qualifying. At this time of very considerable all-round depression I regard these figures as distinctly satisfactory. Many of the students have written with great appreciation of the help which has been given to them, and desire to convey to the Board their gratitude and thanks.

It would not be right for the Board to spend money in increasing the

quantity of dentists, unless it was also striving to improve the quality of the training which they receive. To this end we have, as you know, helped those schools which were prepared to help themselves, and it has been gratifying to find that many schools were not only anxious but able to do this. But we have recently thought it right to add a further stimulus in the case of two schools, whose premises and equipment were not found to be satisfactory, by declining to send bursars to them until improvements have been made. This may seem a little hard on the schools, but it has seemed to me only right that, just as we take all the care we can to select as bursars only those who will do credit to their training, so we should take care that the bursars selected receive a training in such surroundings as make it possible to derive the greatest advantage from it.

DENTAL BOARD PROSECUTIONS.

Turning to another subject, I have to report that since the last meeting of the Board thirty-three prosecutions have been successfully undertaken, and the fines imposed have ranged up to £25. There is one case in which I am particularly glad to report that the Board has been successful. A practitioner obtained entry to the Register, although it was known that he had not an entirely clean record. It subsequently came to the Board's notice that there were matters of which, at the time that he applied for registration, he failed to make mention, and, as the result of an inquiry, they ordered that his name should be erased from the Register. He appealed to the High Court unsuccessfully against this decision. Subsequently he brought out an ingenious scheme whereby patients were to take their own "bites" and he was to provide them with dentures without infringing the Act. In spite of the fact that during the proceedings before the Board he had acquired a great distaste for that body, and particularly for its Chairman, he was good enough to offer his scheme to the Board on condition that they would replace him on the Register and reimburse him for money which, he thought, he had failed to earn. I need scarcely say that the Board did not entertain the offer, and directly the scheme was put into operation, acting on the authority of the Discipline Committee, I directed that proceedings should be taken, with the result that the magistrates decided that the Act had been infringed, and inflicted a penalty of £10 with £10 costs. The defendant stated his intention to appeal, but subsequently thought better of it. It is satisfactory to be able to report, therefore, that the first serious attempt to make a breach in the Act has failed.

PRACTITIONERS' ANNOUNCEMENTS.

With regard to the announcements of which practitioners may make use, I am glad to say that, as the result of steady pressure, the Registrar

has reported 150 cases in which, during the past twelve months, considerable modifications have been effected. No one who is interested can have failed to notice that the more blatant type of announcements have entirely ceased, and I have no doubt that much has been done to improve the position of the profession and to bring it into line in this respect with others of a similar kind. My own feeling is that we have progressed rather faster than I thought we should, though not yet so far as I hope we may.

I must, however, add one point. It is possible for us to deal promptly and, as I have shown, effectively with any case brought to our notice, so that anyone who is aggrieved by the announcements of a neighbouring practitioner has only himself to blame if the matter is not brought to our attention. I must add, however, that we treat all anonymous letters, purporting to be written by dentists, as if they had come from other persons, and give them the attention which they merit, for it would be an insult to the profession to assume that dentists belong to the class of person which writes anonymous letters.

CANVASSING.

The anonymous letter habit shows itself not only as regards cases of advertising, but also as regards canvassing, in which it is equally futile. A considerable number of alleged cases of canvassing are, however, properly reported to us, but it is sometimes not easy to take them up on account of the difficulty of obtaining evidence. Three cases are, however, being brought before you at this session. Without prejudging them, I can say that, if the charges are found to be proved, the Board should not hesitate to take action. It is often alleged that practitioners have arrangements with the agents of Approved Societies whereby patients are, in effect, not given a free choice of dentist. Experience shows that the Societies are willing to deal promptly with any of their agents who can be proved to have acted in this way, and the Board will not be slow in taking its share of the duty of putting an end to a practice which is so highly undesirable in the interests of both the public and the profession.

DENTAL HEALTH EDUCATION.

May I finally refer to the Board's work in dental health education. I believe that, looking to the future of our nation, it is quite the most valuable work which the Board is carrying out. It is proceeding smoothly, and with the willing co-operation of the main organizations concerned with public health; and, so far as I can judge, good value is being obtained for all the money spent. This value may not be reflected in any recognizable form, either in the fees received by dentists or in the receipts of dental manufacturers, but I feel sure that it is definitely intensifying in the public mind the importance of the proper

care of teeth, and indicating to very great numbers of people, who otherwise would be completely careless, the proper methods to adopt to keep their bodies free from disease or infection entering through the mouth. And this, surely, is most important and valuable work.

An Address on the Legal Liabilities and Responsibilities of the Dental Surgeon*

BY ALEXANDER G. R. FULLERTON, O.B.E., F.R.C.S., D.P.H.

IN dealing with my subject I propose to refer, in the first place, to the question of the defence of dental surgeons against charges affecting their professional skill generally, which may be brought against them. Next, certain general questions concerning the extent of the legal liabilities and responsibilities of the dental surgeon will be mentioned. The specific difficulties and mishaps which may occur in the course of the daily practice of the dental surgeon will be illustrated, as shown by the experience of the London and Counties Medical Protection Society, with which I have been associated for the last thirty years.

PROVISION FOR THE LEGAL DEFENCE OF DENTAL SURGEONS IN MATTERS AFFECTING THEIR PROFESSIONAL INTERESTS.

The Medical Protection Society was founded, in the first instance, to protect the interests of medical practitioners when attacked unjustly in respect of matters arising out of their professional work, and to maintain the honour and interests of the medical profession generally. After the Society had been in existence for a number of years, and had become established on a sound financial basis, it was decided, in consequence of numerous applications from dental practitioners, to admit them also to membership.

At the present time the Society has some 9,000 members—about 6,500 medical and about 2,500 dental. The funds available for the defence of members are:—

(1) Accumulated funds, invested in trustee securities, amounting to £43,000, and

(2) An annual income of about £10,500*, of which £9,000 is derived from annual subscriptions and about £1,500 from interest on investments.

These funds are earmarked for the *defence* of members of the Society. In addition, under a re-insurance policy at Lloyd's, members

*Paper read before the Liverpool and District Odontological Society, 16th November, 1925. (The Dental Record).

are insured against *adverse costs and damages*, to an absolutely unlimited extent, in any action which the Society undertakes on a member's behalf, and in which an adverse judgment is given.

It may be added that one of the three Trustees of the Society, two of the Vice-Presidents, and two of the eleven elected members of the Council are practising dental surgeons. There is a Council and a Local Advisory Committee, who meet once in every week and deal with all applications from members for assistance. Then there is a Dental Sub-Committee consisting of the two dental Vice-Presidents and the two elected members of the Council, to which are referred all purely dental cases. A considerable number of the more serious cases referred to the Society by dental members involve, however, general medical or surgical rather than special dental consideration. These are dealt with by the whole Council, assisted, of course, by the dental representatives.

The advantages to a dental surgeon of belonging to the Society are twofold. Should any accident occur in his practice, except as a clear result of culpable neglect or carelessness, he is guaranteed against financial loss of any kind. If trouble arises from what one may term permissible carelessness or oversight, the Society, whilst it may feel that it is useless to take the case into court, will come to the best possible terms with the opponent; and will pay any monetary compensation that may be necessary to settle the case. If damaging statements are made about the professional work or character of a member, all necessary legal steps to vindicate him will be taken. If the case comes into court, the member has the advantage of expert management of his case by a Council which has a very long experience as to the best way of conducting cases in which the professional interests of medical and dental practitioners are concerned, and as to the kind of expert evidence that is required. In this connection I would like to add something as to the advisability, should you become involved in any professional difficulty, of leaving the management of your case entirely to the Society. Someone once remarked that the man who, when ill, treated himself had a fool for his physician; the principle applies with even stronger force in legal matters. Should any complaint likely to lead to legal issue be made against you with regard to your professional work, you are advised most strongly to take no action yourself in the matter. If a member of the Society you should refer the matter to the Society at once. If not a member of the Society, then go at once to a solicitor. A professional man who is assailed by an attack on his professional work will frequently, as the experience of the Society has shown, if left to himself, prejudice his case from the beginning. In very many cases, charges of unskilful work or negligent treatment are without a foundation; and the person attacked is frequently in a frame of mind which leads him to write extremely injudicious letters, and to make statements which may prejudice his case seriously, if it comes into court. Many

of the difficulties of the Society arise from unfortunate letters and statements made by members who have been attacked before they have placed their affairs in the hands of the Society.

Apart from the vindication of the professional reputation of members who are attacked unjustly, there is the complete relief from financial liability. What this financial liability may mean is illustrated by the now well-known case of Adams and Another *ats.* Harnett, in which the Society was engaged recently. In this case the Council of the Society were advised by their legal officers that their members had acted perfectly correctly, and in accordance with the interests of his patient, and that he was amply protected by the Law as it stood. However, the patient brought an action in the King's Bench against our member and another medical man. The High Court Judge took a view of the matter which was strongly adverse to our member and his co-defendant; he summed up very strongly against them, and after a trial which lasted eighteen days, the jury awarded the plaintiff £25,000 damages and his costs. The Council appealed the case; but meanwhile the Society had to pay some £12,000 into court before the appeal could issue. The Appeal Court reversed the verdict of the lower court, and our member got a complete judgment in his favour. The patient then appealed to the House of Lords, and lost again. In the result, having won the case, the Society having had to pay out over £7,685 as the cost of the member's defence, recovered only £2,665. The Society was thus left some £5,020 out of pocket as the result of the completely successful defence of an action which should never have been brought.

I may next refer to some questions relating to the liabilities of dental practitioners generally.

RESPONSIBILITY FOR THE ACTS OR DEFAULTS OF AGENTS.

The liability of the dental surgeon in this respect has to be considered, especially in relation to the results or acts or defaults on the part of—

- (1) A duly qualified dental assistant, or a nurse;
- (2) A partner;
- (3) A *locum tenens*; or
- (4) An anæsthetist engaged for a dental operation.

As regards (1), the experience of the Society has been that action may be taken either against the qualified assistant, by whose act or default the alleged damage to the patient occurred, or against the principal himself, or against both parties. It is true that if damages are awarded against the principal on the grounds of negligence or unskilful treatment by his assistant, acting as his agent, the principal has grounds for action against the assistant—a right which will rarely afford any satisfaction. The claim of the patient who alleges unskilled

or negligent treatment is not affected in any degree by the fact as to whether he has paid for the treatment or not. Dental surgeons attached to hospitals where treatment is given gratuitously are liable equally with the private practitioner to action for damages. In more than one case in which injury by a student in the dental department of a hospital was alleged, the dental surgeon on duty for the week has been proceeded against, although he may not have been near the hospital on the day on which the alleged damage occurred. In the case of alleged injury by the act of a nurse employed by a dental surgeon, the principal will always be the one against whom proceedings are taken.

Every partner in a firm of dental practitioners is liable to be proceeded against, as a member of the firm, for results of the acts or defaults of his partner or partners. It is a common practice to provide in both medical and dental partnership deeds that each member of a firm shall be responsible financially for the results of actions brought against the firm in respect of his individual acts or defaults; but this arrangement is a purely domestic matter, and action, so far as the complainant is concerned, lies against the firm as a whole.

The question as to the responsibility of the principal for the acts and defaults of a *locum tenens* who, as his agent, is carrying on the practice during the principal's absence, is very much the same as that applying to the case of the qualified assistant; in spite of the fact that it has been argued that the *locum tenens* does not act as an agent of the principal in the same sense as an assistant, but rather as an "independent contractor."

The responsibility of the dental practitioner for damage arising in the course of, and due to, the administration of an anæsthetic will be referred to specially a little later on, when dealing with the question of anæsthetics generally.

PROFESSIONAL CONFIDENCE.

With regard to medical practitioners, the law as to professional confidence is extremely strict. Under no circumstances whatever may a medical practitioner convey to a third person any information to the prejudice of a patient who he has attended. So strict is the law on this point that, even under serious conditions threatening the health of the husband, the medical practitioner is liable to an action if he discloses to the husband, who is responsible for the payment of his fees, any facts regarding the health of the wife.

Actions arising from breach of confidence are, from the nature of things, of rare occurrence in the course of dental practice; but the Society had once to consider a claim for damages made against a dental member who had made to a third party a very unwise statement as to the cause of the unhealthy condition of the mouth of one of his patients. Under certain circumstances, in panel practice for instance,

such a statement may be privileged; but in the particular case there was no defence of any kind.

INJURY AS THE RESULT OF A PATIENT NOT ACCEPTING THE ADVICE OF THE DENTAL SURGEON.

In at least one case, which perhaps fortunately did not reach the Law Courts, a curious point as to what may be termed dental ethics arose. A patient consulted a dental surgeon with regard to her mouth; he advised very strongly a certain course of treatment which involved extraction of a number of carious teeth. The dental surgeon pointed out that serious septic complications were likely to follow if the patient's wishes for conservative treatment, and not his professional advice, were acted on. The dental surgeon subsequently did what the patient wished to be done; and, as he had predicted, serious septic trouble followed. The patient then threatened an action against the dental surgeon, on the grounds that he had deliberately carried out a course of treatment which he was aware would lead to serious trouble. A question of this sort can arise but rarely and, so far as we know, has never come to an issue in the Law Courts. Nevertheless, there might be some difficulty in justifying the action of either a medical or dental practitioner who deliberately carried out, for his own gain, a course of treatment which he had advised the patient would probably be injurious.

LIABILITY OF THE DENTAL SURGEON TO CRIMINAL PROCEEDINGS ARISING OUT OF HIS PROFESSIONAL WORK.

The possibility of a dental surgeon having to face proceedings in a Criminal Court in connection with his professional work appears to be limited to two sets of circumstances, involving either—

- (1) A charge of indecent assault on a female patient whilst under, or partly under, the influence of nitrous oxide gas; or
- (2) A charge of manslaughter, in connection with the use of dangerous drugs.

It would appear, from text-books on forensic medicine, that dental surgeons were at one time specially liable to charges of rape or indecent assault under these circumstances. Whatever may have been the risk of this in the past, the records of our Society, which go back for about thirty-five years, do not suggest that the risk is a considerable one at the present time—the Society has not had to deal with a single case of the kind. Otherwise, two charges of indecent assault have come within my personal knowledge within the last twenty-five years. In one case the charge against the dental practitioner was undoubtedly a false one, and an absolute acquittal was the result. In the other case a dental practitioner was convicted of an assault on a patient whilst under gas. A great deal of sympathy was expressed for him at the

time; but subsequently a second conviction for a similar offence was recorded against him.

In any case no dental practitioner should ever administer a general anæsthetic to a woman, except in the presence of a third person. If he does so he has only himself to thank for any trouble that follows.

THE POSITION OF THE DENTAL SURGEON WITH REGARD TO THE ADMINISTRATION OF DANGEROUS DRUGS.

The legal responsibility of the dental surgeon with respect to the administration, for dental purposes, of what are known technically as dangerous drugs—cocaine and substitute drugs, and nitrous oxide—may be considered next.

With regard to cocaine and its substitutes a rather remarkable opinion was expressed, in 1902, by the then Lord Chief Justice, to the effect that a dental surgeon without a medical qualification was not entitled to administer a dangerous drug such as cocaine. And shortly after then—I cannot give the exact date—a London coroner directed his jury that they must consider the question of returning a verdict of manslaughter against a dental surgeon without a medical qualification in a case in which death had followed the administration of cocaine for the purpose of an extraction.

No case of this kind has, so far as I know, come to actual issue before a law court; but the position of the dental surgeon with regard to cocaine, at any rate, is now established completely under Regulations made by the Secretary of State, under Section 7 of the Dangerous Drugs Act, 1920, which provide that the drug may be prescribed and used by a duly qualified medical practitioner or a registered dentist.

I have been called upon to give evidence, on behalf of the Society, in two cases in which damages were claimed for alleged ill-effects following the use of cocaine. In one case the defendant, a dental surgeon, applied a dressing containing cocaine-lanolin, carbolic acid, oil of cloves, etc., to a cavity in a painful molar tooth. The amount of hydrochlorate of cocaine used did not exceed one-twentieth of a grain. The plaintiff, an apparently healthy young man, said that he had felt sick and dizzy after the application, that he had fallen down in a "fit" on the day afterwards, and that the "fit" had been repeated a fortnight later. Damages were claimed on the ground that the alleged epileptic fits were a result of "delayed" poisoning by cocaine; a claim based on a statement, quoted from an American source, in a well-known text-book on therapeutics. And it was argued that, instead of cocaine, an alleged less dangerous substitute, novocain, should have been used. Owing to various legal difficulties very considerable expense was incurred by the defendant, until finally the case was remitted from the High Court to the Gloucester Assizes. The jury, without any

hesitation, and after hearing only two witnesses for the defence, returned a verdict for the defendant on the grounds that the epileptic fits could not possibly have been caused by the cocaine, and that the drug had been used properly and with due skill. It may be added that it was ascertained subsequently that the plaintiff had suffered from epileptic fits from an early age. This case, it may be added, was not referred to the Society until shortly before the date when it was heard at the Gloucester Assizes. Had the Society dealt with the case from the commencement, the member, although he won the case in the end, would have been saved an expenditure of some £600 in the matter, incurred before the assistance of the Society was obtained.

As ill-effects, and even death, will happen, from time to time, with the use of cocaine and similar local anæsthetics, it may be just mentioned that it seems to be certain that, for the production of equal degrees of anæsthesia, there is no difference between cocaine and allied substitutes. To produce the same degree of anæsthesia which is produced by a given weight of cocaine hydrochlorate, a distinctly larger dose of the substitute must be given; and the risk of toxic symptoms developing appears to be equal in either case. In the administration of cocaine for dental purposes, in view of any difficulty arising, the following rules should always be followed:—

- (1) Adrenalin should be administered with the cocaine; and
- (2) The solution should be made quite freshly; and the dental practitioner should be prepared to show that the solution was properly prepared with a recognized percentage of the drug, and that the dose given did not exceed the pharmacopœia standard.

The question of the responsibility of the dental surgeon in the administration of nitrous oxide is one as to which two opinions are possible; and divergent opinions in this matter have been expressed at local meetings of the British Dental Association. In the first place, nitrous oxide must be described as being a dangerous drug. A drug which produces the profound effects on the respiration and circulation which are caused by "gas" cannot be regarded as otherwise; and at least two deaths under nitrous oxide, administered for dental operations, have been recorded during the present year. Now, anyone, whether medical practitioner or dental surgeon, or an unqualified person, may administer gas or any other general anæsthetic; there is no law to prevent him doing so. If, however, death should follow the use of the anæsthetic, the administrator, in order to avoid the possible consequence of a charge of manslaughter, would have to show that he was possessed of ordinary knowledge and skill in the administration of the drug. Now, as far as experience in the administration of nitrous oxide goes, the average dental surgeon who has been through the ordinary dental curriculum nearly always is better qualified by

practical experience than the average medical practitioner who may administer gas for him. But the matter might be pushed a little further. In connection with nitrous oxide; the question might be raised whether the ordinary training of the dental surgeon qualifies him to deal with medical emergencies which might arise out of the administration of the gas. In the event of death occurring under the anæsthetic in the case of a patient with heart disease, for instance, the question might be raised whether the dental surgeon has acquired by his special professional training sufficient knowledge to diagnose heart disease before the administration of the anæsthetic. Most of us would hold the opinion strongly that a general anæsthetic should not be administered without a preliminary examination of the heart.

Another question which might arise in connection with the unfortunate results arising from the administration of nitrous oxide is as to the common practice, in the case of simple extractions, for the operator himself to administer the anæsthetic. I am fully well aware how common the practice is, and how difficult it is to avoid it. But no medical practitioner would, except in a case of distinct urgency, undertake single-handed the administration of a general anæsthetic together with any operative procedure. A case occurred recently in which a dental surgeon was working single-handed, and in which a piece of tooth passed into the lung; the point was raised that the combined administration of the anæsthetic and the extraction operation were more than, in the interest of his patient, a dental surgeon should have undertaken single-handed.

Apart from the case in which the anæsthetic is administered by the dental operator himself, there is the matter, already mentioned, as to his liability when a qualified medical practitioner, or another dental practitioner, administers the anæsthetic on his behalf. In such a case it has been suggested that the anæsthetist, being presumably specially skilled in the work, is not acting as an agent or assistant, but as what is termed an "independent contractor." If the latter point of view was taken, probably the anæsthetist would be personally responsible to the patient for the results of his own acts or defaults in connection with the administration of the anæsthetic; but the law on this point is uncertain.

CIVIL LEGAL LIABILITIES, IN DETAIL, OF THE DENTAL SURGEON, AND INDIVIDUAL DEFENCES.

A general idea of the legal liabilities and responsibilities of the dental surgeon in connection with his everyday practice may be formed on a short review of a single year's work of the Medical Protection Society. On December 31st, 1924, there were 8,289 members on the Society's register. Of these, 6,069 were "medical" members, and 2,220 with a dental qualification only were engaged in practice.

Applications, either for advice or for legal assistance, were received from 231 dental members during the twelve months preceding. Thus the ratio of the number of applications for help to the number of dental members on the register was about 1:9.5—a proportion, it may be added, about equal to that prevailing amongst the medical members of the Society.

The occasions for the various applications to the Society may be classified as follows:—

Applications for advice in ethical matters and other general matters connected with dental practice	61
Applications for legal assistance in connection with allegations of negligent, unskilful, etc., treatment:—	
Allegations as to ill-fitting dentures, etc.	56
Allegations of injury, etc., in connection with extractions	49
Allegations as to unskilful filling of teeth	12
Allegations of negligent treatment, etc., in various other dental matters	53
	—
Total	170
	231

The first group of sixty-one applications for legal advice, or for general advice in ethical matters, covered a very wide field. The matters in which advice was sought included, amongst others, questions as to the liability of principals for work done by assistants or *locum tenentes*, and the liability of honorary dental officers attached to hospitals; questions relating to dental panel practice and to the employment of dental surgeons by local education authorities and at maternity and child welfare centres; questions as to the recovery of overdue fees, as to income tax assessment, as to the liability of dental surgeons to claims for payment of a special water rate in respect of water used in the surgery; and as to liability in a case in which a patient sprained her ankle by slipping on a mat when leaving the dental surgery.

These matters being such that merely advice as to procedure or conduct was usually required, we may consider briefly the second group of 170 applications which were concerned with complaints or claims for damages for injury or loss caused by alleged unskilled, negligent, or careless treatment. Out of the 170 applications of this kind, no fewer than fifty-six had reference to complaints as to alleged unskilful workmanship in the fitting of dentures. These complaints come within two classes. In one class the denture has been fitted, paid for, and worn by the patient for some length of time. After, perhaps, several months it is alleged that the plate does not fit and a claim is made for repayment of the fees. Under the ordinary circumstances of such cases the dental surgeon is advised that he should offer to see the patient, without any further fee, in order to make any readjustment which reasonably may seem to be required. Occasionally it has happened that special arrangements have been made for the payment of fees by instalments; so much when any preliminary ex-

tractions are done, so much more at intervals afterwards. It has happened that, the first instalment having been paid, and the work being well in hand, the balance of the fees as agreed has not been obtainable. In such case the practitioner is advised that, having accepted a portion of the fees and having commenced the work, he should proceed with it; and, having carried out his part of the contract, should then take any steps necessary for the recovery of the balance of the fees when the work is completed. In the second, and commoner, class of case arising out of alleged unskilful workmanship in connection with dentures, no complaint whatever is made until, and again perhaps not until after, the denture has been worn for many months (in one recent case the plate had been worn for eighteen months), application is made for payment of fees due for the work. In a large proportion of this kind of cases the practitioner usually decides that, ultimate recovery of the fees being doubtful, it is better to write off the loss, rather than be involved in the loss of time and the worry incidental to County Court litigation. Otherwise a defence against the charge of unskilful workmanship has to be raised. It may be said at once that the outcome of these cases has been usually, in the experience of the Society, unsatisfactory. There is a tendency on the part of the County Court judges to accept the patient's statement that the plate is uncomfortable and will not fit, as against expert evidence brought forward by the Society on behalf of the practitioner.

Complaints as to injury caused by alleged unskilful or negligent extraction of teeth come next on the list; and then complaints as to troubles attributed to unskilful fillings. The grounds for complaint are naturally various; and the most serious charges which may have to be met in these and other cases will be considered next, in connection with the analysis of the nature and origin of the cases in which it has been necessary for the Society to take action in the Law Courts, by way either of defence of dental practitioners against claims for damages made against them, or by way of taking action on their behalf against patients.

Since 1912 the Society has appeared in court in altogether forty-one such dental actions. If the number of actions defended appears to be small, in relation to the number of applications for assistance received from year to year, it must be remembered that a number of cases have to be settled, in the interests of the practitioner, out of court, and that a large number of claims for damages are not proceeded with when once it is understood that the claim will be contested by the Society. Moreover, the period covers the years 1914-1918; and it was the experience of the Society that litigation affecting the professional interests which it represents diminished in a very marked degree whilst the War was in progress.

Some Thoughts About Painless Dentistry

BY MOSES JOEL EISENBERG, D.M.D., BOSTON, MASS.

NO greater compliment or assurance of complete faith can any dentist ask from any fellow human being than to have that person become a patient of his. In due recognition of such faith it is but right that we as dentists should not only return full value for the fee received, but a far greater return should be made in the form of care and precaution in the management of painful operations.

What dentist has never resolved to practise painless dentistry? To offer a painless relief from suffering, and a painless restoration of damaged or missing dental tissues? If there is one such dentist we should at once embalm him and present him to some museum of abnormal psychology as a rare specimen of whose race no others should be born.

All of us, unfortunately, have not been able to realize our hopes in accomplishing these painless operations, whether it be through awkward "heavy" fingers, through impatience or through any one of the many psychic influences of our professional care and personal temper. Nevertheless, all of us, whether we are successful or not in the field of painless operations, are anxious to study and improve our methods.

PATIENTS' FEELINGS ANALYSED.

I have found that the greatest aid to the performance of painless operations is to love to work on children, and dentally to manage all adults as we would children. The psychology of an individual in the dental chair is quite different from his mental attitude anywhere else. The person is torn away from himself, as it were; he becomes the inert "thing" upon which the various actions are performed and treatments imposed. His mind is wandering from noise to noise and from movement of hand and blink of eyelash to movement of hand and blink of eyelash. The utter invisibility of our motions to the patient's eyes are the basis of his apparent distrust and discomfort, to say the least, and, above all, it brings the patient on the edge of extreme nervous tension, at which stage even the minutest pain is enough to cause intense and mental suffering. If, however, the patient is handed a mirror and permitted, in theory at least if not actually, to follow the work, a good deal of the tension is removed and a large amount of confidence is re-established.

RELIEVING THE NERVOUS TENSION.

It is always well to discuss vaguely the work of the operation to be performed. For example, it is better to say, "I will now prepare this or that cavity for filling," than mutely to approach the patient, seize

the instruments and delve into the depths of a lower wisdom tooth, where every move of yours causes beads of perspiration evoked by fear to add to the mechanical difficulty involved in the treatment. It is not at all necessary to go into scientific detail: rather that is bad; but, attempting to familiarize the patient with the need of some noise or tapping in the carrying on of your work, explain the vibrant characteristics of the enamel and alveolus. Remind them that even delicate cavity excavating causes sounds which are carried to the ears of the patient, and that noises most often are the cause for unexpected jolts and starts. Actual pain in the majority of dental operations is almost unheard of, as it is always the fear of greater discomfort or greater pressure and even the fear of that sudden "jab" that annoys our patients so.

It is wise to engage in some conversational banter with the office assistant at such times, or even the awful practice of asking some unimportant question of the patient, so that he may be thinking about the framing of an answer as soon as his mouth is at liberty. All these tend to relieve to a certain degree the nervous tension of the patient in the chair.

PRESSURE AND PAIN.

Try to explain to the patient the difference between noise and pain and the difference between pressure and pain. This pressure and pain is often the cause of considerable humour in my office. It is my practice before the extraction of teeth or roots under local anæsthesia carefully to free the gum attachments from the necks of the teeth with a small bistoury similar to Beer's cataract knife. This I find prevents to a large degree the chances of post-extraction oozing of blood. At the same time I apply pressure and ask this question repeatedly, "Do you feel pressure or pain?" I also explain that the extraction of a tooth under local anæsthesia is similar to the removal of a tight fitting glove from the hand or of a ring from the finger, emphasizing at the same time that even though pressure of pulling is felt no pain is experienced. I have found that even though the patient is sceptical at first, his curiosity has been aroused, so that a certain amount of fear is replaced with the spirit of adventure with which all humans are endowed. It is perhaps odd to refer to dental operations as adventures, yet in a larger sense they are adventures into the unknown realm of mental or physical sensation.

INSIST ON CONFIDENCE.

Another aid in quieting a nervous patient is to insist on confidence, yes! even full confidence in you, before you begin the work, otherwise you must explain that their failure to trust you fully is at once an insult to your attitude of consideration for them and at the same time an insult to their intelligence in choosing you as their dentist. It is also

well to state that you can reasonably expect their full faith until such time as you may cause them to lose that faith in you through your carelessness in causing them to suffer pain.

At all times resolve to meet your patients more than half-way. Demand faith. But always be ready to instil trust in them by your gentle demeanour and judgment and careful handling of your instruments.

PATIENTS' SUGGESTIONS.

Never disregard patients' suggestions, even if they do come from the lips of laymen. Follow their suggestions or not, as your judgment dictates, but listen to their suggestions. They are paying for the time, and unless you are inflicted with a "wind bag" they are justified in demanding your attention. Many a time an important clue in diagnosis is inadvertently dropped from the lips of some unsuspecting patient.

To do painless dentistry will be much easier at all times if your instruments are sharp, your manners soft, your water tempered and your pressure of instruments considerate to the tissues. Never experiment on human tissues. The experiments are very likely to result in severe pains which cannot be stopped by ordinary means. Be firm, but gentle in your attitude both during and after treatment, and your patients will be glad to tolerate slight pains, as they will realize that they are absolutely unavoidable.—*American Dental Surgeon.*

The Fundamentals of Denture Construction*

WILLIAM A. GIFFEN, D.D.S., DETROIT.



AFTER a couple of years of studying, discussing and analyzing controversies and plans for improving dental progress along the lines of education, relief, libraries, research, journalism, reciprocity and efficiency in dental organization, I assure you it is a pleasure for the writer to return to a discussion of denture construction.

At that time, as even now, a large majority of the members of our profession believed that the most important step in denture work was making impressions and models so perfect that the dentures made from said models would stick in the patient's mouth under all circumstances, no matter what shape the mouth was, so long as the cusps of the teeth appeared to interdigitate when the mouth was closed.

The nomenclature on positional occlusion has been improved to a degree where we can better understand each other.

Occlusions, as thus far defined by the National Society of Denture Prosthetists, are: central occlusion, right lateral occlusion, left lateral

*Read before the Indiana State Dental Association.

occlusion, protrusive occlusion, retrusive occlusion and intermediate occlusion.

Central occlusion is the occluded relation of the teeth with maximum contact between the upper and lower teeth. This relation of the teeth is that to which and about which the other occlusions are established and function. Central occlusion is a passive, inoperative relation of the teeth that pertains to the design of the masticatory apparatus and not to the function of it.

Protrusive occlusion: Any occluded position of the teeth anteriorly to centric occlusion.

Right and left lateral occlusion: Any occluded position of the teeth laterally to centric occlusion.

Retrusive occlusion: Any occluded position of the teeth posteriorly to centric occlusion.

Intermediate occlusion: Any occluded position of the teeth between central, protrusive, right and left lateral and retrusive.

In practice these movements are inseparably combined in many ways to produce the triturating movements by which food is prepared for digestion.

Dr. Gysi, who has probably spent more time in scientifically recording the normal movements of the mandible in mastication than any other man, has proved that the mandible first moves downward and a little laterally from centric occlusion and then moves strongly laterally and a little downward. The mandible returns to centric occlusion by moving upwards and a little toward the median line until the buccal cusps of the mandibular molars and the maxillary molars are interdigitated, after which it slides upward and inward to the position of centric occlusion.

To perform the incising movement, the mandible moves from the position of centric occlusion downward and forward and then upward until the edges of the mandibular incisors are in contact with the edges of the maxillary incisors. It then moves upward and backward with the teeth in contact to the position of centric occlusion.

We also know that there is slight retrusion under masticating stress in centric occlusion which is limited by the occlusal planes of the cusps of the teeth, the movement of the teeth in their alveoli and the resiliency of the articular cartilage in the temporo-mandibular joint.

The combination of these elementary movements, together with the natural wear on natural teeth, creates a condition at the plate-wearing age, which can only be reproduced in the most perfect artificial teeth by combining those movements in an oscillating manner.

These facts have been known to the prosthodontist for many years. The late Dr. Black demonstrated this to the dental profession by correcting the mal-occlusion of his dentures by chewing abrasive powder.

Dr. Green showed a technique on the old style straight line articulator by using a pin a little smaller than the holes it passed through,

holding the two parts of the articulator together, then grinding abrasive powder between the teeth on the articulator, after which the dentures were transferred to the patient's mouth and the grinding continued so long as any malocclusion remained in any position of the mandible. With few exceptions, the dental profession did not seem to realize the value of this procedure. It was not until within the last six or seven years that this improvement over spot-grinding was taught.

At Dallas last year, Dr. M. M. House demonstrated the feasibility of using a mechanical expedient which worked on the oscillating principle of reproducing the mortar and pestle effect in centric occlusion.

This tooth form at the plate-wearing age is found in a very large majority of cases which may be called normal, or in cases which are so close to normal that the patient can readily wear denture with the teeth arranged for normal cases, with the aid of automatic grinding in the mouth.

In the remaining percentage of abnormal cases, it would be better to have them treated by the denture specialist who may record all mandibular movements, adjust articulator to abnormal movements, and carve special teeth to suit each form of abnormality.

The best effort of the manufacturer is to furnish correctly formed teeth for average cases and leave to the specialist the work of making the changes of form necessary for any abnormalities which the case may present, if the patient is willing to pay for the experimenting.

To get down to fundamental facts we must start from centric occlusion and get back to centric occlusion from any direction without interference, in order to build efficient and comfortable dentures.

To the question, What is the most common cause of lack of efficiency and comfort in wearing full artificial dentures? I would say that the answer is, mal-occlusion, the principal cause of which is carelessness in making measurements registering the relation of the mandible to the maxilla in centric occlusion.

This is the fundamental basis of successful denture practice; all secondary operations, such as lateral and protrusive check relations, to compensate for tissue change under the denture bases and in temporomandibular joints, adjustments for compensating planes either of the occlusal surfaces of the dentures or individual teeth, are simply refinements of the fundamental necessity of getting the right starting point.

The profession must also learn that the mentioned tissue change which we cannot control and which takes place rapidly in many edentulous mouths, will require correction from time to time. So if I could get this one thing over, and forget everything about an articulator except that it is a measuring instrument, and that when the measurement of centric occlusion is made that relation must be retained, most of us would be rendering much better service.

The old question of "How do you take the bite, Doctor?" can be settled by any one if he will only follow the plan of Dr. Gysi as laid

down by him a number of years ago, of describing the Gothic arch with a needle point on a metal occlusal plate in opposing occlusal plane, the resultant Gothic arch outlining the necessary limits of horizontal, retrusive, protrusive and lateral movements.

Dr. Gysi himself, while in Detroit about five years ago, assured us that all further refinements in eliminating occlusal interference could be made by the patient chewing an abrasive paste in the mouth. He stated that this procedure would produce practical accuracy in approximately seventy-five per cent. of the cases, and that the other twenty-five per cent. required vertical measurements for compensation which would necessitate an instrument or articulator with adjustable condyle paths.

Dr. Gysi's findings have been checked up by many of the denture experts in this country, a few of whom expected to discredit Gysi's claims. To date the great volume of work done scientifically has only proved the accuracy of his findings.

I might refer you to an article appearing in the February issue of the Dental Cosmos, in which Dr. Connors, of Ohio, undertook to verify the work of Dr. Prentiss; and Dr. Connors' observations and conclusions were that while there might be perforations of the meniscus and articular cartilages of the temporo-mandibular joints these could best be explained on the grounds of inflammatory processes and congenital defects. Dr. Connors further accuses Dr. Prentiss of not using sufficient anatomical evidence to bear out his contention.

The writer was largely responsible for the reorganization of the National Society of Denture Prosthetists eight years ago. I had come to the conclusion that despite the claims of the leaders in this phase of work that this or that instrument, or a certain technical procedure, would eliminate all difficulties in denture construction, the mystery was getting greater all the while, as we were all working in individual cycles like our articulators. You know that the old barn-door hinge, with tight joints, works on one cycle of a sphere, and while we know we must have at least one rotation point, there was no stopping the designers of articulators after they got started on the cycle of working out spheroidal spheres. In fact, they got so many spherical movements into articulators that they could move in so many directions they just ran wild. So I believed that if we could get the ideas of the designers all analyzed, the result would be, if the plan were adopted, an articulator which would combine the good points of all and might be called the Liberty articulator. Our work would then be worth while, not only for the pleasure of the dental profession, but the comfort of edentulous humanity as well. We have made a great deal of progress, but the ideal of a Liberty articulator is still a future prospect.

We have, however, proved that efficient dentures can be built on any of the instruments analyzed by our geometry committee and that the designers of these articulators have acknowledged this fact. There-

fore, it is evident to me that any further progress in articulator construction must be made in the direction of simplicity, precision and reduction of cost.

To further summarize the work of to-day, I would like to quote the specifications I am sending to the applicants for a Michigan license. I consider this a simple, accurate licensing test on this subject, and hope it may eventually serve as a part of the practical training in the dental colleges of the world:

First, take impressions off metal models mounted on occluding frames furnished by the Board.

Second, make working models from impressions and trim bases of same to form of the metal models.

Third, form trial plates to fit working models.

Fourth, build occluding rims of base wax on trial base plates, check back to metal models on occluding frames and trim occlusal planes to marks on frames.

Fifth, make transfer from occluding frame with face bow with trial plates attached.

Sixth, place working models in trial plates, stick together with sticky wax and mount on your articulator.

Seventh, select whatever make, form and size of teeth you please and set up in centric occlusion.

The minimum passing test will be that they must check back on metal models in proper position on occluding frame. These are fundamental measurements upon which all further refinements for esthetics and efficiency, such as arch form, compensating curves, etc., must be based.

A dentist who cannot do this simple test cannot possibly build dentures which would be worth anything to the patient.

Solving the Other Fellow's Problem

“E are all idealists at heart in one way or another. It is interesting to note how eager everyone is to help solve any problem that may come up—especially if it be not his responsibility. If you doubt this, just read the letters from the public that come to the editor of any daily paper giving suggestions for the solution of every problem before us.

“The teaching instinct is strong in all of us, and in his secret soul almost every one believes that he could find the answer to each of the other fellow's problems. The scene changes when these problems become ours and we must shoulder all of the responsibility that goes with them.”

Public Dental Health Education

"The public has decided it wants health talk and means to get it! The lay press is the most powerful medium of instruction for the public in health matters. We must do our best to secure its co-operation!"—Sir Thomas Horder.

IN this department each month will be published short articles suitable for use in the public press. The material has been authorized by the Oral Hygiene Committee of the Ontario Dental Association and members of the profession may feel free to arrange for its publication in the local papers or magazines.

"JUMPING TOOTH-ACHE."



YOU have been fortunate, indeed, if you have never experienced that worst of all dental pains—the "jumping tooth-ache."

But perhaps you have listened sympathetically to your little chap as he tried to tell you, between sobs, how something just seemed to be jumping up and down inside the tooth that pained more and more intensely as he lay with his cheek against the pillow.

Almost instinctively, perhaps, you had him sit up, and he found, happily, that it did not hurt nearly so much as when he was lying down.

Now you thought perhaps it was because he stopped thinking about it so much when sitting up, that made the pain more bearable, but just why it "jumped" you were not so sure.

Well, no doubt you have had a cut finger with an area of inflammation around the wound, and you noticed that the pain was of a throbbing character, that with each pulse-beat there was a sharp little stab, so to speak.

Now, the same with the tooth,—with each heart-beat a new supply of blood is forced into the pulp tissue which, being inflamed and already engorged with blood, is subjected to an increased and severe pressure (at each beat), and a consequent response on the part of the nerves as they are subjected to the abnormal pressure. This we call pain.

Then, with your little chap sitting up, the flow of blood to the head was lessened, resulting in a milder rush of blood into the tooth pulp, which caused a decreased pressure, with lessened pain.

* * *

THE SIX-YEAR MOLAR.



YOU have heard your dentist call this first double tooth "the six-year molar."

Why is this? You have perhaps guessed it—that it is because it erupts usually at about the sixth year.

Now, you have been observant enough to note that it is a *first* tooth in the sense that no tooth was lost to make room for it, and, coming in

at this early age, you may have thought it a "baby tooth" which would, in due time, be shed.

So, in your child, you have, perhaps, neglected to give it the care that it deserved—with disastrous results.

Without doubt, this neglect is the most common of dental sins committed by parents, and perhaps with gravest consequences to their children.

Because, should this tooth become so badly decayed within from four to six years following its eruption as to infect the "pulp," your dentist, as a rule, has no recourse but the use of the forceps—and losing the tooth, the whole series is deranged, since, in a real sense, this six-year molar is the key tooth of the dental arch.

However, Nature is gracious, for sometimes you will find that where this tooth has been lost at an early age, the second molar has "drifted" forward to fill the space, with the third molar advancing in turn as it erupts.

But this is only rarely the case—better a little care at the proper time to prevent this trouble rather than to rely on Nature for a cure.

* * *

THE INCISORS.



YOU are very particular to keep these eight front teeth (four upper and four lower) white and sound, so their function, then, to you, would seem largely esthetical.

But they have another use from which they take their name—that is—to *incise*, or cut.

In your child you have seen them erupt with three distinct tips or tubercles, which by and by have worn down to leave a straight cutting edge.

This notching is a purely normal development, being due to the calcification of the enamel covering from three separate centres. Now, you have noticed too, with perhaps no little concern, that upon eruption the two upper front teeth (central incisors) seemed quite out of proportion to the size of the face, giving them an ungainly appearance.

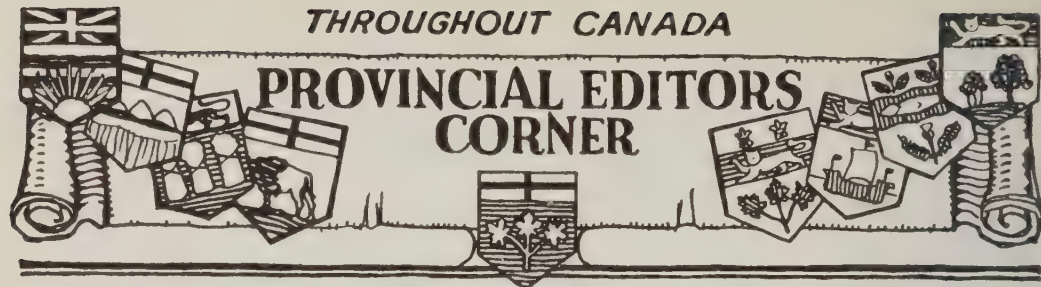
But you must remember this—that while the face will grow larger, the teeth will not increase in size—so Nature has planned with foresight as you might have guessed.

Now try this: Consult a mirror, and note the shape of your face. To which of the three types does it incline, tapering, oval or square? Then study the form of your upper central incisor—imagine it inverted, and observe that it conforms to the shape of your face. Nature is very attentive to details, ever striving for harmony.

Remember, then, that you must give redoubled zeal to the care of these incisors, which are not merely useful but are also an asset to your appearance, if rightly cared for.

THROUGHOUT CANADA

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QUEBEC.

MONTREAL DENTAL CLUB.

DR. EDWARD KENNEDY, of New York, was the clinician before the Club at the February meeting.

Dr. Kennedy, who has become a very well-known writer and prosthetic operator, gave a very helpful, practical Clinic at the McGill Dental School in the afternoon. He carried out the various steps of sectional compound impression-taking, designing of compensating bar dentures, Jackson wire clasp-making, wire-bending, etc., illustrated by a very fine display of models and appliances.

After dinner at the Mount Royal Hotel, Dr. Kennedy gave an illustrated lecture on the various steps of his technique.

The Mount Royal Dental Society and the Montreal Technicians' Study Club were guests at the Clinic; also several members were present from Quebec, Sherbrooke and Ottawa.

Dr. and Mrs. Kennedy remained in town for several days, taking part in winter sports. Arrangements were made by Drs. Cameron, Dohan, Walsh and Lowry.

A. N. J.

SOCIETE DENTAIRE DE MONTREAL.

THE regular monthly meeting of the Societe Dentaire de Montreal was held at the University Club on February 19th. The guest of honour, Dr. A. E. Webster, Professor of Operative Dentistry, of the Faculty of Dentistry, University of Toronto, gave a talk on "The factors which influence the longevity of the human dentition."

—P. G.

SASKATCHEWAN.



OME time ago there was inaugurated a movement by the Regina Dental Society, looking toward the bringing together of the various dental societies of the southern part of the Province.

Last year the Moose Jaw Society came to Regina and put on a very successful clinic at one of the regular meetings of the Regina Society.

Last week, at the invitation of the Moose Jaw Society, Regina dentists in large numbers, together with representatives from Cabri, Herbert, Swift Current and other towns in the southern part of the province, were their guests.

The Moose Jaw boys, whose hospitality is so well known, excelled themselves on this occasion.

Drs. Robb, Brett and Switzer were the clinicians for the evening. Dr. Robb took up Crown-work; Dr. Switzer, Abutments, while Dr. Brett gave a discussion on "How to Handle Patients."

Committees were appointed to arrange similar meetings with Saskatoon and towns in the northern part of the province.

* * *

Dr. F. C. Harwood, of Moose Jaw, was one of the main speakers before the annual meeting of the Saskatchewan Trustees' Association last week. Dr. Harwood's address was on "The Need For Oral Hygiene," and was well received by the large convention.

* * *

The dentists of Saskatchewan are beginning to talk of the coming meeting of the Western Canada Dental Society, which will be held at Edmonton this summer. It is expected there will be a large attendance from this Province.

* * *

ALBERTA.



HE visit of Dean Seccombe to Calgary, as the guest of the Calgary Dental Society, following so shortly that of Dr. Sim Wallace, afforded the members an opportunity to compare two very different views on the interesting question of diet. Most of the members were not in agreement with Dr. Wallace's views, and were pleased to hear, in an excellent paper, views on the aspects of diet as it related to dentistry, with which they were in accord.

Dr. Seccombe gave a complete and excellent presentation of his subject. He explained a system of diet, diagnosed by means of charts, which simplifies the business of making an accurate study of the faults of diet in any given case, and shows how to correct them with a minimum of change in the patient's habits of food selection.

At the noon luncheon of the Board of Trade he gave a talk on the

same subject to an interested group of business men, and left on the night train for Edmonton to discuss dental standards with the University of Alberta authorities, and to meet the Edmonton Dental Society as the guest of honour.

Visits such as this help to promote a Canadian viewpoint in dental affairs, bring useful knowledge, and in the case of public addresses do much to elevate in the public mind the standing of dentists in their own communities.

J. W. C.

The Durable Satisfactions of Life

 R. ELIOT wrote a book some years ago which he called, "The Durable Satisfactions of Life." It is an interesting book and worth reading every few years as a check-up on our viewpoint.

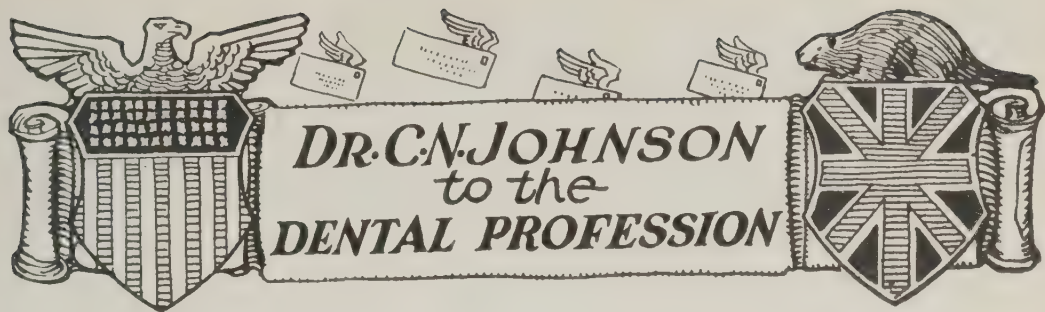
What an agreeable business living a life would be if each of us managed his affairs on the basis of the amount of durable satisfaction to be gotten out of them. How much that is petty and irritating would eliminate itself from our experience if we were always careful to take a longer view of life and make our decisions on that basis.

Should we not seek to dramatize life and render it of highest interest to ourselves and our associates? There isn't a vocation that can not be made more interesting and useful than it now is. The men who have learned the art of dramatizing their businesses do not have to go far to find enjoyment and entertainment—they get fun and entertainment out of their work as they go along. They also get the enthusiastic cooperation of their associates.

Appreciation of Office Assistants

 OMEONE has said that "every man ought to be required to wait on himself occasionally just so he may learn what a lot of trouble he is to others merely to give him ordinary care. He would get a new viewpoint on our material civilization if he were to go camping in the wilderness for thirty days without a guide or any one to prepare and serve his food, get his bath ready, mend his clothes, and the hundred and one things that are done for us every day."

Wouldn't it be useful if we had to carry on our office for a day or two every year without a dental nurse or the various other helpers we find so convenient and so necessary? We would get a new viewpoint on the value of those who day by day throughout the year render faithful, painstaking service, and who make such a large contribution to our success.



The Ontario Dental Association



THE coming diamond anniversary of this splendid organization brings to mind the noteworthy work which it has accomplished in the development of dentistry in Canada. I do not chance to know whether or not it was the first dental society in the Dominion, but at least it was among the earliest. And its influence has been always for the upbuilding of dentistry.

From such men as Chittenden, Willmott, Wood, Nathaniel Pearson, Cæsar, Trotter, Sparks, the Martins of Ottawa, and scores of others who might be named—from such stalwarts as these on down to the splendid men of the present, there has been a steady growth, keeping pace with the development of dentistry, and fostering the best traditions of our calling.

Not that the progress has always been uniform, not that there has not at times been a “reversal to type” and a slipping back toward the primitive; not that the Association has not occasionally suffered from the proverbial limitations of human nature, and found itself floundering a bit when the going was rough—all of these conditions have occasionally confronted it, as they have confronted every enterprise conducted by man. But in the main the trend has been upward, and it would seem that in recent years the advance has been unusually marked. It is a real inspiration to note the increasing energy displayed in conducting these meetings, and in the interest manifest. It speaks volumes for the future development of dentistry in Ontario when the attendance is relatively so great as compared with the number of practitioners in the province. I do not know of any similar organization with so large a percentage of membership.

But membership is not the only thing that tells the story. The character of work accomplished by the organization is more important than mere members; the quality of papers read and the clinics given count for more than large attendance; and beyond all of this there is something of even greater significance which many in the profession seldom seem to consider. It is well to have fine papers and good practical demonstrations. A clash of opinion is conducive to development of ideas, and this leads to wider knowledge; but the thing of prime

importance is the extent to which all of this is recorded in the mouths of the patients. In other words, the question is not so much the benefit to the practitioner as it is the benefit to the people. If our meetings were called merely for the good to be done to the profession there would really be an element of selfishness in it, and back in the head of every man attending a dental meeting there should some place be found the conviction that every bit of knowledge gained must directly be translated into the betterment of the people he serves.

It is the glory of the professions that it is their privilege to serve, and when the sum total of all there is of satisfaction in life is measured by the march of time, it will be found that the supremest joy comes from the good we have done to others. Therefore, the work of the Ontario Dental Association has not only been of service to the people of the Province, but I am very sure it has brought happiness to its members. And yet the past must be considered only as an earnest of what shall be done in the future—only as a beginning, only as a little flash of light in the great flood of scientific achievement which must shine in the days to come. Let each member take to himself the full measure of responsibility in bringing this about.

C. H. Johnson

Montreal Dental Assistants' Association



THE regular monthly business meeting was held at the Université de Montreal. Mme. Guay, president, introduced the speaker of the evening, Dr. J. Nolin, Vice Dean of the University of Montreal, and member of the Advisory Board of the Association, who spoke on the subject of "Operative Dentistry," followed by a demonstration of practical work.

The Clinic Class was held at McGill University Medical Building, Dental Faculty, February 28th. Miss R. Firth, chairman, presided. The speaker was Dr. J. S. Dohan, Associate Professor Prosthetic Dentistry, McGill University, who spoke on "Laboratory Technique." Miss M. L. Parker, R.N., who is the organizer and teacher of the Trained Attendants' Association, spoke on "The Advantages of Organization," which was beneficial to everyone present. The next Clinic Class will take place on March 15th, 1927.

Oral Health



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Vol. 17

TORONTO, MARCH, 1927

No. 3

EDITORIAL

Medical Qualifications for Dentists

IN certain European countries to-day it is required of every dentist that, in addition to his dental qualifications, he possess the medical degree. There are those on this continent who urge the desirability of a similar provision, forgetting that where these conditions prevail Dentistry is lagging behind. This is not an entirely new problem. It was seriously debated fifty years ago, and the British Medical and Dental Journals of 1879 and 1880 contain many references to the question and not a few letters from correspondents. Among the latter were many outstanding medical and dental practitioners, including Sir John Tomes, one of the founders of the British Dental Association.

The British Dental Journal recently published the following extracts from Sir John's letter, which throw considerable light upon this interesting question:

" . . . The next point urged by Mr. Cattlin is that a person should be a surgeon first and then a dentist. The paragraph in which

this opinion is embodied is too long for verbal quotation. It may be put in other words—that the education of the dental surgeon shall exceed by two years the education of the general surgeon. For it has been conclusively shown that the medical and dental curricula cannot rightly be included in the same four years . . .” the dental “curriculum, in its nature three-fifths medical and two-fifths dental or special, has been approved by the Medical Council, and is adopted by the four surgical corporations which grant dental qualifications. It requires that of the four years to be devoted to professional studies two shall be given to dental hospital practice; practically, that the mornings of two years shall be devoted to one part of the required technical knowledge—the acquirement, under competent teachers, of manipulative skill in operating upon the teeth, etc., and it cannot be rightly contended by competent practitioners that less time will suffice. It is admitted on all hands that the four years allotted to medical education, if well employed, are not more than sufficient for the attainment of the knowledge requisite to competence; and if this time be not well employed, failure must be the result at the examination table, even to the extent of a fourth, sometimes a third, of the candidates for diplomas. *How, then, can another subject which takes two years of special study for its acquirement be thrust into the more than occupied four years of medical education?* If it be thus thrust in, the general or the special education must be neglected. . . .

“*Now is it reasonable to require of the dental practitioner a higher degree of professional education than is required of the medical practitioner?* Yet this condition would be enforced if the two qualifications are to be honestly gained. *Would it be possible to enforce this unreasonable educational cost in time and money upon each of those who will be required to fill up the life-waste of the existing three or four thousand dental practitioners?* Surely not. We have nothing to do with the exceptional few who are favoured by unusual talent or pecuniary resources. If too little be asked of them, they can distinguish themselves by adding more. The necessary medical and dental knowledge must be required of the rank and file, and the dental licentiateship provides this.”

Under educational conditions that prevail at the present time it would be equally impossible to require every dental licentiate to hold the medical qualification. The time involved would be at the very least eight years and probably more, if present standards of dental education and training were maintained.

It is clearly the duty of the Dental Profession to press forward, keeping ever in mind the ideal of Dental Health Service for the people, including in the dental curriculum all needful fundamental medical and dental studies to prepare the dental graduate for health service and fostering the closest and most cordial co-operation with Medicine, that the public may receive the best possible service.

Dental Standards and the Canadian Universities



THE Carnegie Report on Dental Education will be published at a very early date, and among the many important questions with which it will deal is that of pre-dental standards. New York State, the Provinces of Quebec and Ontario, Harvard University and others, have already declared themselves in favour of two years beyond High School graduation, or, in other words, and in the educational language of Canada, two years beyond Arts Matriculation. Dr. W. J. Gies, in behalf of the Carnegie Foundation, has been engaged for some years in the study of dental education in the United States and Canada, and has urged the absolute need for two pre-dental years in his advocacy of the so-called 2-3-graduate plan.

Possibly the strongest argument in favour of two pre-dental years, aside from the broader educational and cultural advantages, is that such a requirement places Dentistry and Medicine upon precisely the same preliminary foundation, and enables a student, at the completion of his pre-professional studies, to proceed either with Medicine or Dentistry.

Because of the close relationship between these two professions, and that the teeth are not only affected by, but themselves affect, systemic conditions, Canadian Universities generally regard the proposal to make the entrance requirements for Dentistry similar to Medicine, as being the obvious thing and in the best interest of better dental health service for the people.

Representatives of the Canadian Universities meet in annual conference, and it has been decided to consider the problem of dental education at the conference to be held in June of this year. It would naturally be expected that the Canadian Universities would play an important part in the unifying of dental standards in the Dominion of Canada. Such an accomplishment would be a most fitting contribution to the Sixtieth Anniversary of Canadian Confederation, and would be welcomed in dental circles in other countries, as well as having great national significance in the Dominion of Canada.

Appointment of Delegates to the Canadian Dental Association



AT the request of the Board of Governors of the Ontario Dental Association, the Board of Directors of The Royal College of Dental Surgeons of Ontario, has considered the appointment of delegates to the C.D.A., and, by mail vote, decided that insofar as Ontario is concerned the appointment of Pro-

vincial delegates to the Canadian Dental Association shall be made by the Ontario Dental Association, and not by the Board.

This decision is in accord with the plan followed by the American Dental Association, whose Board of Delegates is appointed by the State Societies and not by the Licensing Boards, thus uniting the voluntary dental organizations in a national body. The Provincial Boards in Canada ought also to be so organized for the discussion of examination methods and standards as these may relate to licensure. Problems of legislation and professional discipline might also be considered by the boards with great profit, as the questions involved in each case are fundamentally the same and co-operation would be of mutual advantage.

Dr. A. Gysi Awarded the Marcel Benoist Prize



THE Marcel Benoist Prize for 1926 has been awarded to Professor Gysi for his work on articulation in dental prosthetics. The ceremony of presentation took place in Berne, Switzerland, on December 11th last, when the prize of Frs. 30,000 was handed to Dr. Gysi in the presence of an assemblage of scientists and notable personalities, including the President of the Swiss Confederation, several Councillors, and the French Ambassador at Berne.

The editor of *The Dental Magazine* offers the following information concerning this prize:—The Marcel Benoist Trust is an institution under the control of the Swiss Confederation. The founder, Marcel Benoist, a Frenchman, was a brilliant Parisian lawyer, and also a scientist of a no mean order. He retired very early from the bar, and thereafter devoted himself entirely to travel and study, and to the formation of a magnificent art collection and library. He settled down at Lausanne in 1911, and died in 1918. He left a large part of his fortune to Switzerland to endow a prize to be awarded annually for research work, especially in those branches of learning that are more particularly connected with the health and well-being of the race. The prize amounts each year to Frs. 30,000, and eight prizes have been previously awarded.

Congratulations, Doctor Gysi, on behalf of the Dental Profession of Canada!

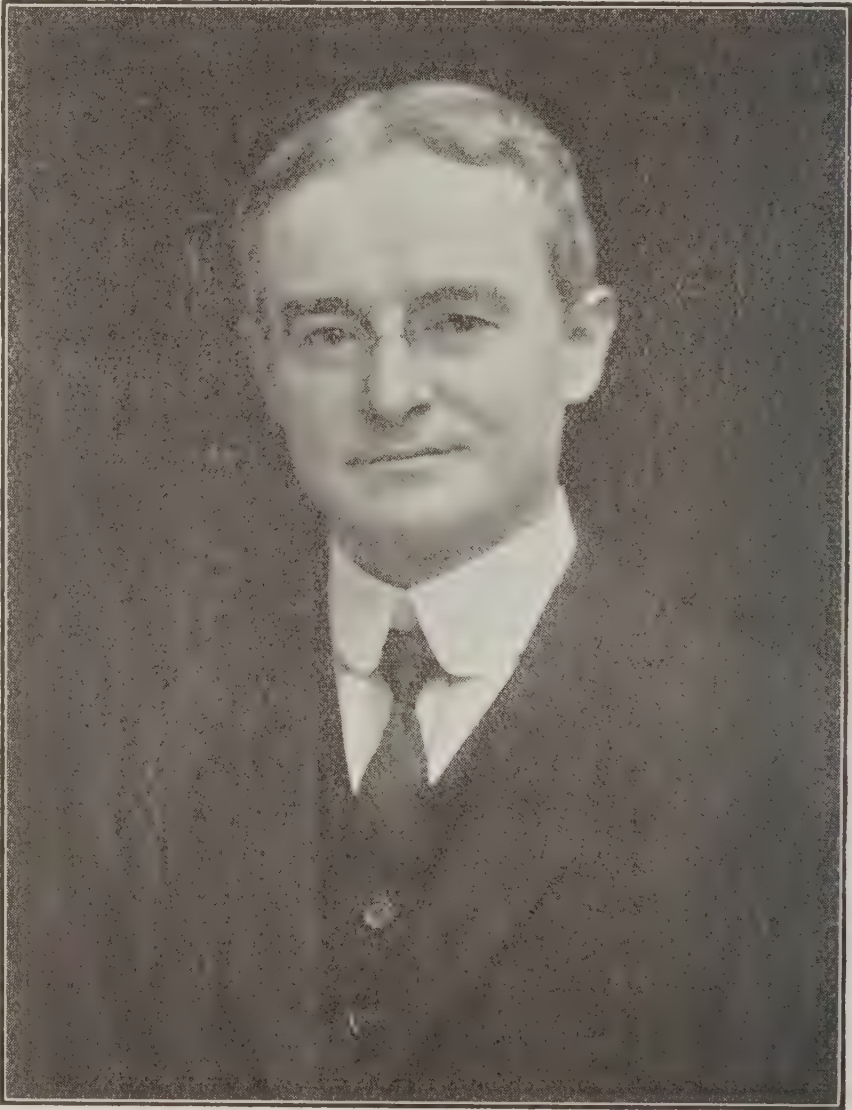
Diamond Jubilee Convention, Toronto, May 16th, 17th, 18th, 1927



THE Canadian Dental Association at the Sixtieth Anniversary of The Ontario Dental Association, King Edward Hotel, Toronto, May 16th-18th, 1927. A cordial welcome will be extended to guests from the United States.

The Things That 'Just Happen'

“THE things that ‘just happen’ to so many of us are things that others have spent long hours of patient toil to perfect—others who have outgrown pride in personal achievement, who work with steady eyes on the future while sacrificing to-day for the things that ‘just happen’ to you and me.”

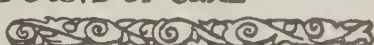


WILLIAM JOHN GIES, PH.D., SC.D., LL.D., F.A.C.D.

Professor Gies was tendered a Testimonial Banquet under the auspices of The New York Academy of Dentistry, in recognition of his outstanding service to Dental Education and the Public Welfare, on the evening of Tuesday, April the nineteenth, 1927, at Hotel Plaza, New York City.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE OUNCE OF
PREVENTION AS WELL AS THE POUND OF CURE



Vol. 17

TORONTO, APRIL, 1927

No. 4

General Anaesthesia in Dentistry

HERBERT E. HOPKINS, M.B., TORONTO.

Assistant Anaesthetist, Grace Hospital. Associate Anaesthetist, St. Joseph's Hospital.



THE consideration of general anæsthesia in dentistry falls naturally into certain simple headings, which we may term:

1. The choice of the anæsthetic.
2. Characteristics and use of the anæsthetic of choice.
3. Pre-anæsthetic preparation of the patient.
4. Administration of the anæsthetic of choice.

The choice of an anæsthetic in oral surgery is of course much more complicated than in other fields of surgery, chiefly owing to the fact that most of the work is done in the office and the patient's mouth must remain open throughout the operation. Naturally, the general condition of the patient must first be taken into account. People suffering from cardiac or renal disease appear to tolerate N_2O-O_2 better than a local anæsthetic, provided the induction is carried out smoothly and the anæsthetic administered with the maximum amount of oxygen so that their breathing is unlaboured and their colour good.

Pregnant patients are frequently referred to their dentist by their physician early in their term, for necessary dental work, and here again I consider N_2O-O_2 the ideal anæsthetic agent, even in the latter months of pregnancy.

The local condition of the patient has much to do with the choice of anæsthetic. A general anæsthetic is indicated when it is difficult to inject without the possible infection of healthy tissue by the needle, as in cellulitis or other wide-spread infections of the mouth.

Palmer, of New York, declares for local anæsthetic "in cases of removal of impacted teeth, excementosed teeth, difficult resections,

alveolectomy, or any other time-consuming operations where it is also a great advantage to have a comparatively bloodless field. It is also useful in the mouth where there is a considerable quantity of porcelain and tooth restorations.¹

When, however, all these can be ruled out and the final result will be the same either way, I think the patient himself might be allowed to have something to say regarding the selection of an anæsthetic. The dread of the needle puncture has kept many a nervous patient from having badly needed dental work done. The imagination of a neurotic patient will frequently cause a severe psychic shock, not from the actual pain felt, but from the anticipation of each step of the operation. I believe that in such cases, if there are no contraindications in their condition, a general anæsthetic should be used. Other patients have a greater dread of losing consciousness under general anæsthesia, and will cheerfully assent to a local, so long as their eyes remain open.

It is generally conceded that no operation which demands a prolonged inhalation anæsthesia should be performed in an office. Such operations as Palmer points out, are better conducted in a hospital where there is less limitation to the choice of anæsthetic. Here, if the operation is to be a long one and the local anæsthetic is contraindicated, ether, with an induction of nitrous oxide-oxygen may be used, to the mutual benefit of both patient and operator.

Ethyl chloride should be used in office work as an inhalation anæsthetic with the greatest caution, and then only with the admixture of plenty of air or with oxygen. It is used only in short operations lasting but two or three minutes, and usually for children, but its employment in the sitting position is never entirely free from danger. Chloroform should never be used except by an experienced anæsthetist, who himself would probably employ it but seldom.

Where ether is to be used, the induction is best carried out with N_2O-O_2 and the ether vapour gradually added, as soon as the stage of unconsciousness is reached, until the third or surgical degree of complete relaxation is attained. This stage may be maintained either by the continuation of the N_2O-O_2 -ether by way of the nasal inhaler and mouth hook, or by changing to ether alone by the nasopharyngeal or oral-pharyngeal method. The latter has the disadvantage of having the ether tube passing through the mouth to the pharynx, an arrangement which is frequently in the way of the operator. The nasopharyngeal administration of ether vapour depends on the passage of soft rubber catheters of ample calibre and properly lubricated through the nose and posterior nares into the nasopharynx, where a continual flow of warmed ether vapour in air can be directed by means of the ordinary electric suction and anæsthetic apparatus used in tonsillectomies.

It is, however, to the consideration of the usual routine anæsthetic of the office that I would direct the majority of these rather rambling remarks. This is still almost universally nitrous oxide-oxygen. The

more recently heralded ethylene has gained but few converts to its use in dental anæsthesia, and in my opinion there has been no anæsthetic to date that can replace the one used for the first time in 1844 by Horace Wells, of Hartford, Conn. In ethylene-oxygen, though it has found a place in hospital practice in many parts of the country, the disadvantages for office use outweigh the advantages. It is highly explosive when mixed with oxygen, and there is too much electrical equipment in the model dental surgery quite capable of supplying the requisite igniting-spark, to allow the operator or anæsthetist much contentment of mind while using it. Its odour is somewhat disagreeable and penetrating, and office and waiting-rooms are soon permeated by an aroma which is certainly not pleasing to their occupants. It is now also generally admitted that there is more hæmorrhage and increased post-anæsthetic nausea following its use.

Very interesting are the answers to a questionnaire sent out by McKesson, of Toledo, to about 150 of the leading professional exodontists in the U.S., and relating to the various anæsthetics employed by them in their practices.² Following is a summary:

The replies received from practically all the number showed that 80% used N_2O-O_2 in 75% of all their operations. In a hypothetical case where a number of teeth were to be extracted in a handicapped patient with such complications as arthritis, anæmia, heart disease, diabetes, nephritis, hyperthyroidism, etc., 36 removed all the teeth at one sitting, 76 divided the operation, and 14 were governed by individual circumstances. The anæsthetic of choice for thus handicapped patients was:—

N_2O-O_2	89
Either N_2O or Infiltration	17
Infiltration	12
Conductive	4
Ethylene	3

This analysis showed that N_2O was considered to be better suited in extensive operations on handicapped patients, and this conclusion agrees with the findings in hospital practice for other operations. There was, however, a decided difference of opinion as to whether all teeth should be removed at one sitting, or the operation be divided.

In this series of approximately 500,000 patients, there were 41 deaths from all causes which were so directly associated with the extraction of teeth as to be remembered and reported. Twenty-four died following the removal of many teeth and 17 deaths followed the extraction of one or two teeth. It is possible that the more extensive operations were often performed on patients with more serious pathology outside the mouth, and that the number of teeth removed had little if anything to do with the death rate. This was, by the way, a remarkably low one, being only about 1 in 12,000.

Ninety-five out of 111 claimed healing was slower after infiltration and conductive anæsthesia than following N_2O-O_2 , and 100 out of 113 claimed that patients complained of more pain following local. Postoperative hæmorrhage in anæmic patients was reported as follows:

Fifty-five claimed less hæmorrhage after N_2O-O_2 .

Twenty-five claimed no difference.

Twenty claimed less hæmorrhage after infiltration and induction.

The preparation of the patient for N_2O-O_2 anæsthesia is important, and if sufficient time is available should always be attempted. The average of postoperative nausea for the extraction of one or two teeth is, I believe, about 4%. In the longer operations where several teeth are extracted and necessary plastic work done, the percentage of nausea and depression increases. Most of this is due to some degree of acidosis and could largely be prevented in those patients coming by appointment if, in addition to advising them to forego the meal previous to the appointment, they were prescribed a short course of alkalization by the use of some mild, easily assimilated alkali and the ingestion of sufficient orange juice. This latter has been enthusiastically championed by B. H. Harms, D.D.S., of Omaha, who suggests that it be taken in amounts of 200 grms. the night and morning previous to the operation³, although better results are obtained if it is started two or three days previously. Neither the orange juice nor food should be taken less than three hours before the administration of the anæsthetic. "With simple orange juice as a preliminary," states Harms, "even the resistant type of patients under N_2O-O_2 anæsthesia lose their combativeness, accept more normal percentages of oxygen and cause less trouble generally."

The use of preliminary narcotic medication before operation in office practice is uncommon. There are two main objections, (1) Postoperative nausea is often increased, and (2) Evacuation from the office is slower. However, in known difficult subjects an H.M.C. tablet No. 1 (with Morphia gr. $\frac{1}{4}$ and hyocine hydrobromide gr. $\frac{1}{100}$) dissolved under the tongue about 45 minutes prior to the operation, is a distinct aid. (McKesson).

The administration of the anæsthetic is the next step. Here the psychologic aspect of anæsthesia is demonstrated par excellence. The average patient will admit readily that he dreads the anæsthetic,—the separation, for no matter how short a time, of himself from his consciousness,—more than he does the actual operation. In the attitude of the anæsthetist to the patient more than in any other one way, I believe the course of the anæsthetic is determined. "A person who never heard of an anæsthetic but who is in pain, or who has suffered and dreaded pain, when his confidence is obtained under conditions of quietude, with the proper soothing evidence of the ministering hand, should 'take a good anæsthetic' as the saying is, irrespective of his racial characteristics. With unbroken faith and sustained confidence, other conditions of

course being favourable, any patient becomes a good anæsthetic risk.”⁴

It thus behooves everyone engaged in the responsibility of anæsthesia to endeavour to instil from the first into the patient a feeling of confidence. There should be no undue fuss or noise in the room, glaring lights should be turned out, and as far as possible all instruments and apparatus should be covered or removed. With the patient in the chair no time should be lost in preparation, and as each step is taken it should be quietly, simply and cheerfully explained. If the induction under N_2O-O_2 is then carried out under pressure, mental reactions are usually eliminated and in from 35-50 seconds complete cerebral anæsthesia is obtained without conscious or subconscious manifestations.

The outstanding guides in every administration are the colour and the respiration of the patient. Sufficient oxygen should always be given to prevent cyanosis, and this percentage will vary greatly in different individuals. No rule of thumb will suffice as a guide for the administration of any anæsthetic, and most especially is this true of N_2O-O_2 . Instruction books accompanying various types of anæsthetic machines are useful only so far as the mechanical directions are concerned. The individual patient under consideration must be taken as the only index to the degree or progress of the anæsthetic.

Respiration is important; it is necessary to sustain life. Any irregularity in respiration should be investigated at once and, if due to mechanical obstruction of some kind, immediately corrected. The regurgitation of stomach contents may prove serious if steps are not taken to clear out the pharynx and maintain a free airway. Other causes of obstruction with resultant cyanosis and reaction upon the cardiac musculature are falling back of the tongue, cramped operating position, external pressure on chest or neck, too tight packing or too loose packing which allows blood and mucous to accumulate in the throat. It is very exhausting to a patient to have to bring the extraordinary muscles of respiration into use for any extended time in an attempt to obtain a sufficient amount of oxygen. If none of the above or similar conditions are present to account for the disturbance, it would be folly to continue the anæsthetic in the face of threatened shock and collapse. It is a valuable safeguard to the patient if the anæsthetist trains himself to listen for each inspiration and each expiration; and if studied together with the pupillary signs and various reflexes it is an adequate guide to the progress of the anæsthesia throughout the operation.⁵ Deep, regular respiration is also the first means of recognizing the instant when the surgical plane of anæsthesia has been attained.

Proper packing of the throat is valuable both to the surgeon and anæsthetist in the extraction of teeth under gas-oxygen. The purpose of the packing is two-fold; first that no blood, broken particles of teeth, fillings or even loose teeth may be inspired into the respiratory tract; and secondly, to prevent escape of the gases while the operator is working. One has found efficient the plan suggested by Romberger

and Villers, the exodontist and anæsthetist comprising the surgical team at a large dental clinic in Indiana.⁶ After the induction is complete, absorbent cotton of long fibre and highest grade is pushed with the forefinger upwards and inwards against the vault of the palate until it follows the course of the palate backwards and downwards and presses down upon the posterior part of the tongue, preventing it from falling back into the pharynx and effectively closing the aperture between the palate and tongue. If this method is used there is no leakage of gases around the pack and the teeth are left well exposed for the exodontist, who is enabled to work more leisurely, more accurately, more confidently and without worry. The anæsthetist finds that he is able to use a considerably larger percentage of oxygen than is usual for extraction work, and the patient sleeps more calmly.

To summarize the foregoing is difficult. One is reminded that general anæsthesia, as related to dental surgery, varies from general anæsthesia in any other branch of general surgery only in the operating position and locus of operation. In every case the patient is the deciding factor, and the dental anæsthetist must use his experience and skill in the selection and administration of the anæsthetic, with the one object of assisting the surgeon in bringing the operation to a successful conclusion. Nitrous oxide-oxygen still appears to be the safest, and in fact the ideal, general anæsthetic in dental surgery, although before another year elapses, who can say that acetylene, butylene, propylene or other of the hydrocarbon gases at the moment being thoroughly investigated in anæsthetic research, may not have supplanted it?

The work of any surgeon is more or less influenced by the administration of his anæsthetics. In order for him to use his most efficient technique and to obtain the best after-results, his anæsthetist should be one well qualified and expert in his profession. Thus is the ideal surgical team composed and, whether employed in modern dental surgery or in general surgery, cannot fail in assisting towards the well-being of the patient.

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Discussion of Dr. Hopkins' Paper

BY DR. W. B. AMY, TORONTO.

DR. HOPKINS has made certain deductions from the answers to Questionnaires sent out by Dr. McKesson. Answers to Questionnaires are very often misleading and deductions made in this manner frequently erroneous. The judgment of the relative merits of nitrous oxide-oxygen anæsthesia and novocain anæsthesia by the amount of postoperative pain experienced, or said to have been experienced by the patient, is of very doubtful value.

Postoperative pain depends on the resistance of the patient, the operation itself, the reaction of pathological tissue, the compressing and traumatizing of tissues, not necessarily, nor in the greatest degree, on the anæsthetic used.

If the novocain liquid is sterile and isotonic, the adrenalin content intelligently used in relation to the patient, the hypodermic needle sterile and the injection made slowly and in proper relation to the tissues, there is very little, if any, postoperative pain from this source.

I do not believe that either nitrous oxide-oxygen anæsthesia or Novocain anæsthesia should be the exclusive anæsthetic of choice in dental operations. There are many factors to consider: the health of the patient, the nature and duration of the operation, the equipment at hand and the assistance employed. Unfortunately, it is seldom possible for dental operations to be performed with the same attention to detail as is employed in hospitals; this in itself is a very important point to be considered in the choice of an anæsthetic.

Dr. Hopkins has also said the nervous patients are not good subjects for novocain anæsthesia. In my opinion, if premedication in novocain anæsthesia was used to the same degree as in general anæsthesia, the patients would not have sense enough to know at the time of the operation whether they were sensitive or not.

Methods of Combating General Malnutrition of Significance to Dental Teachers*

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THERE is considerable evidence that the glands of internal secretion exercise two notable functions:

(a) They control the development and differentiation of specific tissue during the functioning of the growth impulse

and,

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(b) They direct the generation and mobilization of body energy, and establish the normal rate of our basal metabolism.

Perhaps the glands which are most influential in these processes are the thyroid, suprarenals, pituitary and gonads. The following illustrative statements seem to be fairly reliable:

(A) The thyroid controls the nutrition of the skin, the development of the skull, the complexity of the brain and its convolutions, and the rate of basal metabolism of the fetus.

1. Cretinism, which results from thyroid insufficiency during intra-uterine life, is known by the rough, coarse and creased skin, the undeveloped extremities, lack of muscular co-ordination and absence of normal intelligence.

2. Myxedema is a condition due to thyroid insufficiency, which develops after growth is complete. There is marked obesity, loss of hair and teeth, physical lassitude, mental sluggishness, and a subnormal basal metabolism.

These and many other facts point to the conclusion that the thyroid, through its hormone, determines the rate of energy production and its mobilization. Without such control the individual would have erratic muscular action and a marked inability to realize energy for emergencies.

(B) The adrenals are made up of two parts to each gland: the cortex and the medulla. During early intra-uterine life the cortex is much enlarged. This enlargement seems to greatly influence the quantity of brain tissue developed. Diseases of the cortex after birth profoundly influence normal growth. Tumor in the cortex before puberty induces sex precocity; tumor in the cortex of the adult causes reversion of the secondary sex characteristics.

The medulla through its hormone maintains the tone of the blood vessels and assists in mobilizing body energy for emergencies. The psychic manifestations of fear and anger are closely associated with the individual's adrenal index.

(C) The pituitary gland has many functions which influence the normalcy of the individual both during childhood and maturity. Its hormone determines the normal concentration of sodium (and probably potassium) in the blood; in co-operation with the sex glands (gonads) it brings about certain cyclic periodicities such as rut, menstruation, etc.

It may be safely concluded that no individual will have a normal nutrition unless his glands of internal secretion are functioning normally. This statement is strengthened by clinical experience. I have seen many children who were poorly developed and anæmic apparently as a sequel to some contagious disease such as mumps, measles, scarlet fever, etc. A rational dietary failed to produce definite and beneficial results until their glands of internal secretion were reactivated.

(D) The Parathyroids.

It has been pointed out that other glands of internal secretion maintain a normal concentration of iodine, sodium and potassium in the blood.

There is considerable evidence that the parathyroids are intimately concerned in the assimilation and fixation of lime.

a. If the parathyroids of a dog are removed, the lime concentration in the blood stream drops to about one-fifth normal in from four to five days. Coincident with the decrease in lime, there develops great nerve irritability. The reflexes are sensitized to such an extent as to induce a condition resembling true tetanus.

b. When calcium chloride is injected directly into the blood of a parathyroidless dog, about 70% of it is eliminated within four hours, the remainder within sixteen hours.

c. A parathyroidless rat which is fed milk *ad lib*—to avoid tetanus—develops in about three months incisors with enamel so soft that it may be easily removed; the dentine is coarse and porous, and the structure of the dental pulp is wholly abnormal.

If parathyroids from another rat are grafted to this rat, the new portion of the incisor which appears in about three months, is apparently normal.

The way the parathyroids bring about the fixation of lime is not clear. One theory is that lime salts when taken into the body are diffusible substances, and in consequence would be quickly eliminated, but that the parathyroids (when supplied with an adequate amount of the vitamins A and D) build them into a very complex molecule of high molecular weight. In such form they are not diffusible.

Clinical experience leads one to believe that extreme nervousness in children, or the rapid breaking of the enamel, points to inadequate fixation of lime salts. This may be due to: (a) lack of lime in the food; (b) lack of the necessary vitamins, and (c) defective functioning of the parathyroids.

Reactivation of the parathyroids and enough calcium salts in the diet will generally remedy the deficiency.

(E) Excess lime in diet.

It has been shown, experimentally by Dennis and Minot that the ingestion of large amounts of calcium salts, e.g., calcium lactate, by normal adults, will not raise the calcium concentration in the blood above normal—e.g., 10 mg. per 100cc. of blood. Six healthy men were given daily for six days 90 grains calcium lactate in addition to the calcium in their blood. The average increase in the blood calcium in six days was about one-tenth per cent. Therefore, it seems that deficiency of lime in the diet may bring the blood calcium below normal, but that an excess of lime in the food will not raise it above normal.

(F) Calcium fixation and ultra-violet rays.

It is a fact known to all that rickets is a condition resulting from faulty fixation of lime. It is equally well known that direct sunlight cures rickets when other necessary conditions are favourable. Laboratory experiments prove that it is the ultra-violet rays which cause the lime fixation.

It has been found that fat, oils and other substances which contain cholesterol are made anti-rachitic when exposed to the action of ultra-violet light. Hence, the theory has been advanced that these rays acting on the cholesterol develop in the animal body an anti-rachitic principle. Certain it is that exposure to strong sunlight favours fixation of lime. This illuminates the fact observed by most dentists that the bones and teeth of children after three months in the open are in better condition than in the spring.

(G) Calcium fixation and vitamins. It has been shown experimentally by many observers that an adequate daily intake of calcium is absolutely necessary not only for maintaining normally the bones and nerve tissues, but also for maintaining body weight and vigour. An adult should ingest at least nine grains per day; the requirement for a child between four and fourteen is about twenty grams per day.

In the chance selection of one's daily food, the probabilities are that there will be a notable lime deficiency. Sherman and McLeod found that 51% of a very large number of diets were poor in calcium. This is fostered by three facts:

- a. Unwise grouping of our foods.
- b. Refining processes of manufacturer remove much of the lime naturally present.
- c. Depletion of the soil produces cereals and vegetables which are low in calcium.

Hence, the first requisite is the ingestion of enough calcium. The second conditioning factor is the presence in the diet of an adequate amount of vitamin A. This is found most abundantly in the dairy products—butter, milk, whole cheese, and in eggs and cod liver oil.

McCollum has shown that a balanced ration with one per cent. of cod liver oil gave a better growth and a higher fertility (with lower mortality) in the white rat than did the same ration and twenty per cent. butter.

When the diet is deficient in lime neither butter nor cod liver oil will protect the animal against the deficiency. Animals fed on such a diet grow poorly, have imperfect sex development and manifest a premature senility; they are usually old when they have lived thirty per cent. of their expectancy.

During late winter both milk and butter are relatively poor in vitamin A; hence, it would be of great economic importance to society if butter were supplemented with a small amount of cod liver oil daily.

(H) Cod liver oil and infection. Clinical experiences lead to the conviction that the use of enough cod liver oil during winter is a prophylactic against the milder infections of the nose, throat and bronchi. Extensive tests on school children show that there are fewer colds and digestive disturbances when it is used daily.

Chronic sinusitis is greatly benefitted when food contains adequate lime and the conditions for its fixation are present. The following clinic was given by a practising physician in Indianapolis, Indiana:

"I was for a number of years troubled with sinusitis of the frontal sinuses. Two or three times each winter I would have a very acute condition arise in these sinuses, causing pain over the eyes, extending across the temples. This pain would not be relieved until the infection became so that it 'broke', giving a discharge through the nostrils. I was troubled continuously by a nasal discharge. This condition had existed for about twelve years. Since 1925, I have been taking 20 drops of activated cod liver oil daily. I have not had one recurrence since. The nasal discharge is almost nil and the tonicity of the mucous membrane of the nares has improved one hundred per cent."

(I) All studies point to the conclusion that to maintain normal growth and vigour, the following dietary practice must be observed:

(1) Adequate daily intake of lime. For an adult this should be about 9 grains as a minimum.

(2) Either organic or inorganic lime is assimilated with equal ease.

(3) There must be present the concentration of vitamins A and D represented by 5% cow butter.

(4) Vitamin D in cod liver oil hastens the fixation of lime and strengthens our defence against the mild infectious diseases.

(J) Sources of lime in foods. The following foods are rich in lime: All dairy products, sea fish, onions, spinach, radishes, lettuce, cabbage, tomatoes, celery, carrots, etc.

The leafy vegetables have an additional dietary value in vitamin B. This accessory food is of great value in the growing period; and in adulthood it has to do with maintaining the normal nutrition of the nerve trunks.

(K) Other factors in lime absorption.

(1) A pasty diet retards the absorption of lime. Its habitual use develops a lactic, semi-atrophied intestinal mucosa which becomes coated with an adhesive, tenacious mucus. This is favoured by the ingestion of unnecessary amounts of cane sugar.

(2) Roughage in the diet is essential to good nutrition. It keeps the food porous, cleanses the intestinal mucosa and improves the muscular tone of the entire tract. Whole wheat, bran, and the leafy vegetables, all of which contain notable quantities of cellulose, supply roughage and in consequence favour peristalsis.

GENERAL DEDUCTIONS.

A diet to maintain the vigour of the individual and of the species must harmonize with the following factors:

(1) Adequate biologically active protein.

(2) Adequate mineral salts.

(3) Adequate calcium: nine grains daily for adults.

(4) The proper ratio of calcium to phosphorous.

(5) Adequate amounts of vitamins A, B, C and D.

(6) Porosity and roughage.

(7) Agreeable mental states.

(8) Exercise and sunlight.

The Maternity and Child Welfare, School Medical Service, and Dental Officers' Groups*



COMBINED meeting of these Groups was held at the House of the Society on January 28th, 1927, to discuss the subject of "The Prevention of Dental Caries in Children."

Mrs. Mellanby, Sheffield, Member of the Dental Research Council, opened the discussion, and suggested that it was impossible for the physiologist and those interested in the consideration of the organism as a whole, to ignore general and developmental conditions in their relation to dental caries, and to treat the subject purely in terms of local conditions in the mouth, although such would undoubtedly influence the immediate incidence of caries. Out of over one thousand children, in 80 per cent. the deciduous teeth showed signs of defective structure instead of 3 per cent. as usually stated, microscopic as well as macroscopic examination having been employed. In a series of experiments on dogs reared on diets varying in their basal value and in their lime and phosphorus and antirachitic vitamin content and balance, it appeared that in certain cereals, especially oatmeal, an anti-calcifying substance was present, which might so act as to interfere with the proper formation and development of the teeth and jaws. The important factor was a proper balance between this substance and vitamin D., granted which the cereals in question, e.g., oatmeal, became desirable foods. If the balance was impaired, ultra-violet light assisted the action of the vitamin in securing calcification. Slides were shown to illustrate these points.

Further experiments had been made to show the increased resistance to caries of the teeth of puppies, following feeding, on what Mrs. Mellanby called a "good" diet. There had been an attempt to carry out a similar investigation on children in a tuberculosis hospital, other plans having failed, and although the numbers were not large, it appeared that the resistance of the teeth could be altered by varying certain factors in the diet, the factors increasing the resistance being present in milk, eggs, cod liver oil, etc. Mrs. Mellanby pleaded for further investigation and experiment along similar lines, and under, as far as possible, fully controlled conditions, so that these hypotheses of the effect of a "good" and well-balanced diet on dental structure and decay should be demonstrated on behalf of the growing child.

Dr. C. J. Thomas, on behalf of the School Medical Service Group, said that the mode of production of dental caries was a question of paramount importance, and of a certain undoubted complexity, in

* From "Public Health," official organ of the Society of Medical Officers of Health, England.

which the dogmatic attitudes of different schools did not altogether help the general public. There was room for both sets of opinions, and constructive work could be done on the points on which they could agree. Nobody nowadays would discard the advantage of oral hygiene, and it was equally foolish to disparage the immense field for investigation opened up by Professor Mellanby in his experiments on dietetics. The biological point of view and the changed environment in which man now existed must not be lost sight of in comparing his teeth with those of other mammals. School dental inspection and treatment had wrought an immense improvement in the teeth of children at, or leaving, school; the work of preventing the poor state of the teeth with which the children arrived lay with Maternity and Child Welfare.

Mr. F. Breese, President of the Dental Group, said that he had great difficulty in accepting both the theory Mrs. Mellanby had put forward with regard to dental caries, and the results of any such limited and uncontrolled experiments as she had been able to carry out with tubercular children in hospital. It appeared likely that the children fed on oatmeal had received extra sugar with it which would account for the increased caries in one of Mrs. Mellanby's groups of cases. If the possibility of the calcifying vitamin increasing the destiny of the tooth tissues were admitted, he did not see what power such a tooth would have to resist the action of acids or to destroy the organisms of caries any more than marble would resist corrosion by an acid. If the reverse were possible, i.e., that calcium could be withdrawn from the teeth by a deficiency in diet, was it maintained that there was some selective process at work by which the teeth were affected and not the skeletal structures? This he found hard to believe.

Sir Frank Colyer said that they owed a debt to Mrs. Mellanby for her patient investigations showing that the teeth of puppies could be influenced by the diet. He had come to the conclusion, from clinical observations, that the enamel of the teeth did alter in density, and recent investigations supported this view. He drew attention to the observations of Drs. Colyer and O'Hofy on the effect of carbo-hydrate on the incidence of caries in certain native races. Mrs. Mellanby had concentrated on the defence of the teeth against caries, but both the attack and the defence must be taken into consideration, and in the opinion of those best qualified to judge, the great increase in caries during the last half century was due to the introduction of more easily fermentable carbo-hydrates. Where prophylaxis had been undertaken in relation to this idea, the results had been satisfactory until the influence of the tuck-shop and the lack of proper dental hygiene in boarding school life supervened.

Nitrous Oxide-Oxygen Anaesthesia

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It is not so many years since the use of an anæsthetic, either local or general, for a dental operation was more or less optional with the dentist, and it was not unusual for many dentists to forego the use of any anæsthetic for one of the most painful and most dreaded of operations—the extraction of teeth. However, that day is past, and now, from the standpoint of professional efficiency as well as the public demand, the skilful and popular dentist uses some form of anæsthesia for any operation of a surgical character, and no dentist can consider himself properly equipped who is familiar with only one method of anæsthesia.

Wonderful results can be secured from the skilful use of local anæsthetics, especially if, in those cases where indicated, the infiltration method is supplemented by the nerve-blocking method. And still, in passing, I would like to declare my faith and confidence in the infiltration method of local anæsthesia for at least 90% of the cases where local anæsthesia is to be employed. Nerve-blocking anæsthesia is very valuable where definitely indicated, but is not so necessary nor so effective as many would have you believe.

In my opinion, there are a great many cases where the use of a general anæsthetic is preferable to a local, both from the standpoint of the dentist and the patient. Both by right of discovery and development, as well as the frequent opportunities for their use, the dentist should become familiar with and employ some form of general anæsthesia. The general anæsthetic of choice for the dentist is nitrous oxide and oxygen.

Many theories have been advanced to explain the phenomena of general anæsthesia, and while it may not be absolutely necessary to understand the physiology of nitrous oxide anæsthesia, before one can intelligently proceed to administer this anæsthetic, he should have some knowledge of the phenomena he is trying to produce and should understand, in some measure, how nitrous oxide does produce anæsthesia.

Authorities are more or less agreed that nitrous oxide produces anæsthesia by virtue of its interference with oxidation in the body, which means that the proper supply or distribution of oxygen to the nerve centres is disturbed or restricted to the extent that they are rendered incapable of performing their normal function—that of transmitting or receiving nervous impulses. Consequently, we must regard nitrous oxide anæsthesia as a de-oxygenating process or, in other words, the result of a diminished supply of oxygen.

Now, how does this come about? The functional activity of all the

tissues in the body, including the nerve cells, depends upon a proper supply of food and an adequate supply of oxygen. This supply of oxygen is secured from the air we breathe and is taken up by the blood and carried to the different parts of the body. Now, when nitrous oxide is being administered, it is inhaled into the lungs and comes in contact with the blood which has just returned from its circuit of the body to receive a fresh supply of oxygen. But, instead of a supply of oxygen and nitrogen to greet it, we have nitrous oxide, which is taken up or absorbed by the blood, enters into a loose combination with the hæmoglobin in the blood, and as such travels all over the body, is gradually released and displaces the oxygen in the different tissues. A condition of oxygen starvation of the tissue cells has been established, and when this is applied to the nerve cells we have a condition of unconsciousness or anæsthesia ensue. Now, in the employment of nitrous oxide and oxygen, the anæsthetic part of the mixture is the nitrous oxide, and the oxygen is simply used as a regulator. If the above is a proper explanation of the way in which nitrous oxide anæsthesia is produced, then, in the last analysis, nitrous oxide and oxygen anæsthesia simply consists in administering the nitrous oxide in sufficient concentration and in sufficient amounts to produce unconsciousness by partial asphyxia with the additional supply of sufficient oxygen to prevent this process from proceeding too quickly or too far.

In connection with the administration of nitrous oxide and oxygen, the question of physical diagnosis naturally arises in one's mind. While it is absolutely necessary to make some physical evaluation of your patient before administering any form of anæsthesia, still there is one thing we can remember, that nitrous oxide and oxygen is the safest anæsthetic known, and experts agree that, if properly administered, there are practically no contra-indications to its use.

Along with this, we must take into consideration that:

1. The length of time under anæsthesia for dental operations is usually short.

2. Practically all our patients are capable of looking after their daily duties and are able to come to the office. This is a fairly reliable index to a patient's general condition. A patient's response to effort is an important factor in determining their physical condition.

3. Nearly all patients in hospitals to whom anæsthetics are given are sick—which shows it is not an unusual procedure to administer anæsthetics to even abnormal cases.

4. Any patient who is suffering from any physical malady which has reached a serious stage is usually aware of it and will advise you.

5. Extensive scientific examinations are very seldom made previous to the administering of an anæsthetic; for instance, such an examination as would be necessary to ascertain the presence of diabetes, tuberculosis, enlarged heart; and then such conditions as epilepsy, pregnancy,

status lymphaticus, or any peculiar idiosyncrasy, cannot even be learned by any form of examination.

By observation, visual examination and inquiry, a fairly accurate evaluation of a patient's physical condition can be made, and if the above should indicate something abnormal, a further examination could be made. The nature of the circulation or cardiac apparatus should be ascertained by palpating the pulse, noting the rate and character of the same.

On account of the nervous condition of most patients previous to the taking of an anæsthetic or having any operation performed, the pulse rate is usually about 120. Any variation from this usually indicates, under ordinary conditions, either a fast or slow pulse, as the case may be.

In the case of slow, weak or irregular pulse, the patient should be placed in a reclining position to give the heart the benefit of gravity. We will usually find that any abnormal condition of the pulse will improve as the anæsthesia proceeds.

In the case of patients of advanced years, where the presence of senile changes in the form of arteriosclerosis, feeble hearts or diminished respiratory power is frequently found; pregnant women; patients suffering from tuberculosis, exophthalmic goitre, high blood pressure; patients recovering from pneumonia, pleurisy or bronchitis, or who for any reason are considered poor risks, great care must be exercised to give the anæsthetic slowly and gradually, and establish an anæsthesia disassociated from any strain whatever. Above all, avoid hyper-anæsthesia and you will eliminate practically all your general anæsthetic troubles. Remember that the proper administration of the anæsthetic is more important than the physical condition of the patient. Where patients are under the care of a physician for any special physical condition, it is the wise and courteous practice, where possible, not to proceed without his knowledge and consent; and especially in those cases where some hazard is involved, he can share the responsibility.

TECHNIQUE OF ADMINISTRATION.

It is an important thing to know that a large percentage of cases respond to the same mixture and to the same amount of the gases, and in about the same length of time. And still the percentages of the gases, as well as the amount, should be regulated entirely by the type of patient and by the response of the patient to the anæsthetic.

1. The nose-piece should be slowly and carefully applied with air valves open. Purely from the standpoint of comfort to the patient, the nitrous oxide should be diluted in the beginning with either air or oxygen until the nerves along the respiratory tract become sufficiently deadened that no unpleasantness will be experienced by the patient.

2. The amount of the anæsthetic or flow should be sufficient that at the end of the inspiration there is still some gas left in the bag.

3. The air or oxygen is discontinued after five or six breaths and

NITROUS OXIDE AND OXYGEN ANAESTHESIA CHART

Stages in anaesthesia	Cause	Symptoms				Remedy
		Muscular Phenomena	Respiration	Eye	Colour	
Light anaesthesia	1. Too much oxygen. 2. Air leaking in around nose-piece or apparatus. 3. Non-susceptibility of patient. 4. Inability of patient to breathe properly through the nose.	1. Voluntary resistance or movements. 2. Swallowing. 3. Outcry by the patient.	1. Superficial slow breathing. 2. Prolonged inspiration. 3. Holding of the breath.	1. Pupils large, contract actively to light. 2. Conjunctiva sensitive. 3. Voluntary movements of eyes. 4. Eyelids resist opening, wink when touched.	1. Complexion flushed in anaemia or normal cases. 2. In plethorics, slight cyanosis or no change.	1. Reduce the amount of oxygen in the mixture. 2. Feed the nitrous oxide under positive pressure. 3. Be sure all leaks of air are avoided.
Normal or surgical anaesthesia	1. Proper percentage of nitrous oxide and oxygen.	1. Immobile, no voluntary resistance and sometimes muscular relaxation.	1. Breathing fairly regular with tendency to prolonged expiration. 2. Breathing accompanied by slight snoring. 3. Respiration contracted and slightly faster and deeper.	1. Eye-lid reflex abolished. 2. Eyes usually closed. 3. Conjunctiva insensitive to touch.	1. Complexion fairly normal with tendency to cyanosis. 2. In plethorics, considerable cyanosis.	None required.
Hyper-anaesthesia	1. Too concentrated mixture of nitrous oxide or not enough oxygen. 2. Some interference with free airway, as packing getting too far back, swelling of tissues in the throat, retracted mandible, or some food or mucus causing obstruction of respiratory passages.	1. Muscular rigidity. 2. Jactitation.	1. Irregular respiratory rhythm with prolonged expiration. 2. Pronounced snoring and stertor. 3. Finally, cessation of respiration.	1. Pupils greatly dilated and fixed. 2. All eyelid reflex abolished. 3. Eyes sometimes open.	1. Marked cyanosis. 2. In suppressed respiration, complexion almost black.	1. Increase percentage of oxygen and force, if necessary. 2. Where respiration is suppressed, perform some method of artificial respiration. 3. Remove any obstruction from air-way. 4. Draw mandible forward.

pure nitrous oxide is administered. This is continued until the addition of oxygen is indicated.

4. Different types of patient suggest different treatment. Strong, vigorous, or full-blooded patients usually require very small, if any, percentages of oxygen, while weak, anæmic and low-resistance patients will tolerate larger and varying amounts of oxygen. The secret of nitrous oxide and oxygen anæsthesia is in being able to anticipate the patient's needs before they arrive.

5. The patient is now breathing in nothing but nitrous oxide, and on each expiration is exhaling a certain amount of oxygen and carbon-dioxide along with the other respiratory products. As this process is continued, the normal supply of oxygen in the body becomes gradually depleted. Now, I do not know whether the following is a proper explanation of some of the phenomena which begin to present themselves at this time. If a person is in a room where there is difficulty in getting sufficient oxygen, the breathing becomes faster and deeper. That is exactly what usually can be noticed at this stage in the administration. The respiratory rythm changes, becoming deeper and faster, and this is an indication for the turning on of the amount of oxygen which would be indicated for the special type of patient in hand. We find these percentages of oxygen vary from 3 per cent. to 30 per cent.

6. The percentages of nitrous oxide and oxygen are continued and so regulated as to maintain fairly normal respiration with tendency to snoring, and normal colour with a tendency to slight cyanosis in most cases, until the stage of surgical anæsthesia is reached, a condition marked by the presence of the above symptoms, as well as the abolition of the eyelid reflexes.

7. The signs and symptoms indicating light anæsthesia, surgical anæsthesia and hyper-anæsthesia, with their treatment, if necessary, are set out in the chart, on preceding page, which is a modification of Dr. McKesson's nitrous oxide and oxygen chart.

Making Milk Safe



ATTLE are subject to infection with tuberculosis of the bovine type.

The bovine bacillus is frequently carried in the milk of cattle thus infected.

Children are the largest consumers of milk.

Children are peculiarly subject to non-pulmonary tuberculosis.

Pasteurization, properly carried out, destroys the bovine bacillus without serious injury to the milk.

Most of the larger cities of this country and the larger milk handlers pasteurize their milk.

Milk from non-reacting tuberculin-tested cattle is free from the bovine bacillus.

Orthodontic Considerations

JULIUS GOLDBERG, B.S., D.D.S.



HARLES MAYO, the famous operating surgeon, said, "The next step in preventive medicine is up to the dentist." He also said, "Orthodontia is a coming specialty, not only in dentistry, but in medicine," and again, "Society is going to wield the big stick and demand orthodontia treatment."

Progressive dentists are no longer saying to young patients, "Why not wait and see if nature won't straighten out your teeth?" They do not think that the thumb-sucking, pacifier-sucking and lip-sucking habits, that were once so exaggerated are the only etiologic factors.

The dentist, as well as the student of to-day, has been enlightened. He recognizes malocclusion early, even in the deciduous teeth, and urges treatment at once. The earlier a case is treated the better for all concerned, as it requires less time, the results are positive, and we can exert better control over the patient. For an example: should we find a child three years of age suffering from malnutrition due to faulty mastication as the result of irregularities of the deciduous teeth, they should be corrected and not delayed. Preventive measures are carried out at this early age which insure normal development of the bones of the face and the proper eruption of the permanent teeth.

Almost the first question asked by a parent when bringing a child to you for consultation is, "Can you tell me what is the cause of this irregularity?" The etiology of malocclusion is indeed so large a subject in itself, that it sometimes takes considerable time to reply to that question with any degree of correctness, or be at all sure of the answer to the particular case at hand. Nearly everyone who has written on orthodontic subjects has compiled a list of the causes of malocclusion, until one almost wonders what will *not* cause it, rather than what will.

Just think of the responsibility placed in the hands of a dentist for the future welfare and development of an individual, if advice to parents is given that is unwarranted and unsound. Be sure and tell the parents of the children of the dangers of nasal obstructions and advise them to consult a rhinologist. Proper advice regarding the care and development of the deciduous teeth, proper foods, well masticated, are some of the greatest aids in the development of the "growth spaces," those spaces between the deciduous teeth which are so essential to the eruption and the proper position of the permanent teeth. If you do not want to treat the deciduous teeth in your practice, in all fairness and justice, send the child to someone who will do it correctly.

The loss of the deciduous teeth by extractions and decay with consequent loss of space is enormous. Failure to contour filling, too long retention and too early extraction of the deciduous teeth are causes that come under our observation.

Another condition of importance is the tendency of teeth or roots too long retained, to deflect the crown of the erupting tooth into a malposition. The very inclined planes of the teeth, especially the incisors, mechanically deflect these teeth and, once locked in a wrong position, they will grow and elongate themselves in that position and so become permanently retained there. Sometimes a very small amount of orthodontic treatment is necessary to correct the position of these erupting teeth, with the result that they will develop into their normal places.

Supernumerary teeth should not be allowed to remain wedged in between the permanent teeth, for if this error is made they will cause a condition that is anything but sightly. Like broken down roots of the temporary teeth, they take up valuable space and nature has not allowed room for the normal number of teeth, plus extra teeth and roots in the normal arch.

Mouth breathing is another important factor in malocclusion. The application of stress or force upon the teeth through the medium of regulating appliances must be constantly and evenly applied in order to physiologically stimulate cell activity, thereby causing the teeth to assume and maintain a position in normal alignment, and as the alveolar process is subservient to the use and maintenance of the teeth and the maxilla and mandible, all receive sufficient stimulation to bring about almost any desired change in facial outline. The most beneficial example of growth and development is the changing of narrow and constricted arches with an under-developed mandible that is distal in relation to the upper arch and with a protrusion of the upper anterior teeth as in typical chronic mouth breathers, to healthy normal individuals. The establishing of nasal breathing by expanding the dental arches and giving the patient various muscle exercises, brings about a general development of the body, and is especially pleasing in respect to lungs, mentality and appearance.

We all know that upon acquaintance, it is the real man or woman that counts, and not looks, but we must admit also that until we have had an opportunity to become better acquainted, one's facial expression and personal appearance has much to do with the confidence we feel we can place in them. Looking at the matter from this angle it is easy to see the effects that malocclusion has in influencing one's opportunities in life. Again we might mention the mental appearance, by which I refer to the intellectuality as expressed in the countenance. Occasionally we see people with irregular teeth who have a very bright, intelligent countenance, but this is the exception that proves the rule, for I believe it is almost invariably the case that a person with malplaced teeth, especially with constricted arches so typical of mouth breathers, have a stupid and absent-minded look that is a serious handicap to them, especially in the earlier stages of their careers.

It has been shown time and time again to the parents that where the arches were narrow, upon expansion, a marked improvement in the

ability to apply themselves to their studies has taken place, and this improvement begins to manifest itself in an incredibly short time. The effect of orthodontic interference is far more reaching than possibly some of us realize when the work is carried out correctly.

The dentist who does orthodontic work carries on his work largely with children, and he must be a man specially qualified to deal with them. Moreover, the practice of the specialty of orthodontia calls for perhaps a closer special study than any of the other branches of dentistry. It demands a high standard of mechanical ability, a very accurate knowledge of the anatomy of the parts affected and an absolute honesty of purpose in dealing with the patients and the parents of the patients. The work of the orthodontist is not finished as in the case of ordinary practice, in a day or a week, or at the most two or three weeks; he must carry on the work for years; therefore, it requires a man of individual temperament and particular ability to practise orthodontia.

In the diagnosing of cases, it requires considerable preliminary work. We have the making of original models for study purposes. The plaster casts of the arches should be perfect, so that an accurate arch pre-determination can be had. The method introduced by Dr. Paul Simon of Berlin, in which Gnathostatic models and Phostostatic photos and their use in determining the exact relations of the human denture to the three planes of the head, is of great value to us. Facial casts, photographs, x-ray examinations (intra-oral and extra-oral), all these enable us fairly well to estimate the time required for the treatment. The case history will give us information that is of vital importance, and without this history, we are very likely to promise patients more in a corrective way than is possible to accomplish.

It is a fact that apparently simple cases will not yield to treatment, which is no doubt the result of complicated etiologic factors and the inability to combat them in the absence of any exact knowledge of the peculiarities of development which can be applied to the case. We cannot ascertain in advance of treatment the rapidity with which bone growth will take place, and with all modern means at our command in analyzing the condition, we occasionally run across a case with which we do not get what we desire in the way of results, although fine technique and skilful operative methods enable us to reduce these failures to a minimum.

Cleanliness of the mouth must be very carefully observed during any orthodontic treatment.

We cannot succeed in any special vocation if our interest fails. This may be kept alive by trying to discover new things in old surroundings or new aspects to everyday tasks. Our post-graduate courses and meetings are especially valuable to us in renewing our interests and desires for better things in connection with the practice of a specialty. By reading, attending lectures and clinics, we may get the inspiration, knowledge and skill to do more effective and efficient work.

Here are five good working principles in the conduct of your practice:

1. Determine each morning upon one definite thing worth while which you want most of all to do or obtain that day.

2. Do not admit the possibility of your own inability or defeat. It is the state of your mind that makes for success or failure. Feel assured of your ability to do things and you can go out among men and win them to your way.

3. Keep your attention riveted on the things you want and your own ability to obtain them.

4. Act promptly in the line of your desire.

5. And last. As you step in the office in the morning, say to yourself, "Above all, am I cheerful, am I kind, am I sympathetic and am I in earnest?"—*The Alpha Omegan*.

Infamous Conduct in a Professional Respect



AN Australian dentist, F. G. Keene, who had been found guilty by the Dental Board of New South Wales, of "infamous conduct in a professional respect," appealed to the Supreme Court of N.S.W. The appeal failed, and from the judgment of the Chief Justice—delivered last August and reported in full in the *Dental Science Journal of Australia*—it is made increasingly clear that the Courts in this and in other cases cited hold no doubts whatever as to the complete competency of Dental Boards or other disciplinary bodies to determine, in the particular circumstances of each case, what justly and fairly may constitute "infamous conduct in a professional respect." While the words "infamous conduct" carry with them, perhaps, to many minds an unpleasant significance which is not warranted by the sense in which they are used in the Act, it is still clear that there are "professional respects" in which conduct may be "infamous" without being vile or disgraceful when tried by ordinary standards. The Chief Justice (the Hon. P. W. Street) said he thought the true test is that laid down by the Court of Appeal in England in Allinson's case; it has been acted on ever since, and the same meaning is applicable to the same words in regard to the conduct of dentists. He quoted the definition adopted by the Master of the Rolls, as follows: "If it is shown that a medical man in the pursuit of his profession has done something with regard to it which would be reasonably regarded as disgraceful or dishonourable by his professional brethren of good repute and competency, then it is open to the General Medical Council to say that he has been guilty of 'infamous conduct in a professional respect.'"

Canadian Dental Association Meeting



MEETING of the Canadian Dental Association and of the Executive Council of the Canadian Dental Association will be held in Toronto at the King Edward Hotel during the joint convention of the Ontario Dental Association and the Canadian Dental Association.

Toronto—King Edward Hotel—May 16, 17, 18, 19.

The following special meetings will be held:

Saturday, May 14th, meeting of the Provincial Delegates re proposed changes in the Constitution of the Canadian Dental Association.

Business meetings of the Canadian Dental Association and of the Executive Council on Tuesday, May 17th.

J. STANLEY BAGNALL, *Secretary*.



Diamond Jubilee Convention

The Canadian Dental Association at the Sixtieth Anniversary of The Ontario Dental Association, King Edward Hotel, Toronto, May 16-19, 1927.

The arrangements for this great Convention are now almost completed, and the programme will be the best ever presented at a Canadian meeting. It includes such well known teachers and clinicians as Dr. C. N. Johnson of Chicago, Dr. Russell W. Tench of New York, Dr. Abram Hoffman of Buffalo, Dr. Leonard of Milwaukee, Dr. Robert H. Ivy of Philadelphia, and a number of other outstanding men.

DR. C. N. JOHNSON needs no introduction to the Profession on this Continent. He is the father of American Dentistry, and is a safe and sane leader. The subject of his paper will be "What of the Future?" and he will deal with the problems which are puzzling the general practitioner. Dr. Johnson has the ability, reliability and experience to undertake the difficult task of examining the results of recent research, studying modern methods and determining the course which a general practitioner should pursue. His findings will be received with great interest and profit by the dentists of North America.

DR. RUSSELL W. TENCH, who will present, by essay and clinic, the subject of "Full Dentures" at our Jubilee Convention, was born at Caledon East, Ontario. He lived at Galt until he was eleven years of age, when his father, Dr. J. M. Tench, moved to Buffalo in order to study dentistry. Dr. Russell Tench graduated from the Dental Department, University of Buffalo, in 1909. During his student days he received instruction from Dr. Geo. B. Snow, and four years after graduation he entered the Research Division of the Dentists' Supply

Company, and he became associated with Dr. Alfred Gysi, of Zurich, Switzerland, and Dr. Leon Williams. Dr. Tench is now in private practice and is Vice-Chairman of the Prosthetic Section of the American Dental Association, President of the National Society of Prosthetists, and Clinical Professor of Prosthesis, New York University Dental College. He has given papers and clinics before fourteen State Dental Societies and many Districts and city organizations.

ROBERT H. IVY, M.D., D.D.S., F.A.C.S., is Professor of Maxillo-Facial Surgery, Graduate School of Medicine, and of Clinical Maxillo-Facial Surgery, School of Dentistry, University of Pennsylvania, Philadelphia; Colonel, Medical Reserve Corps, U.S. Army; Consultant in Maxillo-Facial Surgery, Walter Reed Army General Hospital, Washington, D.C.; Vice-President, American Association of Oral and Plastic Surgeons; Author, with V. P. Blair, of "Essentials of Oral Surgery."

Dr. Ivy will show by a paper and clinics how to make a complete mouth examination so as to insure the removal of all dental infections.

DR. ABRAM HOFFMAN gave a very fine paper at the last Convention of the Ontario Dental Association, on the subject of "Simple Appliances on Orthodontia," and showed how the general practitioner can successfully handle these cases. At our urgent request, he is coming back to show by demonstration clinics just how these appliances can be made and applied.

DR. LEONARD will give a paper and clinics on "The treatment of Pyorrhœa."

A full description of the essays and clinics to be given by some of the other teachers on the programme will appear in the next issue of this journal.

Special entertainment is being provided for this occasion. It will take the form of a grand birthday party, to be held at Hart House on Monday night, a dinner dance on Tuesday night, and group dinners and theatre parties on Wednesday night. A big re-union luncheon will be held in the Crystal Ball Room of the King Edward Hotel on Tuesday at noon, and the details of Wednesday noon activities will be announced later. Dr. Rous Mallory, of London, England, has presented a fine trophy for the Golf Tournament, and other valuable prizes have been donated. The games will be played on the Thursday afternoon.

The Ladies' Entertainment Committee is actively at work arranging for the entertainment of the visiting ladies, and dentists who bring their wives and daughters may rest assured that they will spend a most enjoyable time while in Toronto.

NOW IS THE TIME to determine that you will attend this great Diamond Jubilee Convention. Special arrangements will be made in regard to transportation, and the entire Hotel has been placed at the

disposal of the dentists for this week. Decide that you will come, and made your arrangements accordingly.

FRED J. CONBOY,
Secretary, The Ontario Dental Association.

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Ontario and Canadian Dental Association

Meeting at King Edward Hotel, Toronto, May 16th-19th, 1927.

PROGRAMME.

MONDAY, MAY 16, 1927.

Morning:

Second Floor.

9-12. Registration.

The list of Clinics for advance selection will be sent to Members only. All others will make the selections at the time of registration. Members are those who have paid the fee since the first of this year.

Afternoon:

1.30. Exhibition of Dr. McCrum's new motion picture:
"Clara Cleans Her Teeth."

2.00. Official Opening of the Convention.

President's Address.
Memorial.

Dr. J. A. Bothwell.

Dr. C. N. Johnson, Chicago.

"What of the Future?"

Dr. Robert H. Ivy, Philadelphia.

"A Complete Mouth Examination for the Removal of all Dental Infection."

Evening:

6.00 (sharp)

Hart House.

DIAMOND JUBILEE BIRTHDAY PARTY.

Invited guests:

His Honor, the Lieutenant-Governor, W. D. Ross and Mrs. Ross, the Hon. Howard Ferguson and Mrs. Ferguson, Sir Robert and Lady Falconer, the Hon. Dr. and Mrs. Cody, Sir William Mulock, the Hon. Dr. and Mrs. Godfrey. The reception will be at six o'clock and the dinner at six-thirty.

In recognition of the services rendered to Dentistry by the late Dean James Branstons Willmott and in honor of his memory we invited Mrs. J. B. Willmott to cut the birthday cake.

Mrs. Willmott generously acquiesced in our request.

Admission will be by complimentary ticket (only). Tickets may be secured by members of the Ontario Dental Association (in good standing) from the Secretary. As the accommodation is limited and only that number of tickets will be issued the members who desire to attend should apply for tickets early. Accommodation will be reserved for all dentists and their friends in attendance at the Convention from points outside Ontario.

TUESDAY, MAY 17, 1927.

Morning:

9-12. Clinics.

Noon:

12.30 (sharp) Re-Union Dinner.

Speaker: Dr. Don Gallie, Chicago.

Community singing and enjoyable and unique entertainment.

Afternoon:

2.30. Meeting: Canadian Dental Association.

3.00. Dr. Harold J. Leonard, Milwaukee.

"The Treatment of Pyorrhœa."

This paper will be followed by a discussion in which several leading Periodontists will take part.

4.15. Exhibits.

Evening:

6.30. The Dinner Dance.

Special attractive features.

Romanelli's Orchestra.

WEDNESDAY MAY 18, 1927.

Morning:

9-12. Clinics.

Noon:

Oak Room.

12.30. Oral Hygiene Dinner.

Speaker: Prof. Klotz, University of Toronto.

Afternoon:

2.30. Short Business Meeting.

3.00. Demonstration Symposium on "Replacements."

Dr. Russell W. Tench, New York.

Dr. W. D. N. Moore, Chicago.

Half hour for answering questions.

4.30. Exhibits.

Evening:

Fraternity and Class Re-Unions.

Theatre Parties.

THURSDAY, MAY 19, 1927.

Morning:

9-12. Clinics.

Afternoon:

Golf Tournament.

Toronto (Daylight Saving) Time will govern the hours of the meetings. Each Essay and Clinic will start promptly at the hour indicated upon the programme, and the members of the Association are urgently requested to be in their places at the time set.

CLINICS.

Tickets will be collected at all clinics.

All the clinics will be located on the Second or Seventeenth Floors.

I. The Hamilton Clinic Club.

Drs. Fred. Williamson, Maxwell Morrow, Al. Lester, Joe Steward, Hamilton, Ontario.

Subject: "Porcelain."

- II. Dr. Russell W. Tench, New York City.
Subject: "Full Dentures."
- III. Dr. Robert H. Ivy, Philadelphia.
Subject: "How to make a complete mouth examination."
- IV. Dr. W. D. N. Moore, Chicago.
Subject: "Crown and Bridge Work."
- V. Dr. John Jacob Posner, New York.
Subject: "Local Anæsthesia Simplified."
- VI. Dr. Abram Hoffman, Buffalo.
Subjects: "Simple Appliances for Orthodontic Cases."
- VII. Dr. F. E. Roach, Chicago.
Subject: "Partial Dentures."
- VIII. Dr. Harold J. Leonard, Milwaukee.
Subject: "Present Day Surgical and Therapeutic Practice on the Treatment of Periodontoclasia."
- IX. Dr. A. E. Webster, Dr. L. F. Krueger, Dr. Hugh Ross, Dr. W. T. Holmes, Toronto.
Subject: "Common sense root canal therapy."
- X. Dr. A. D. A. Mason, Dr. C. A. Kennedy, Dr. J. Aileen McDonagh, Dr. W. S. Madill, Toronto.
Subject: "What the family dentist must do for his young patients."
- XI. Dr. Wallace Seccombe, Toronto. Dr. Edmund A. Grant, Toronto. Dr. Ross Thomas, London. Dr. J. F. Blair, London.
Subject: "What should the dentist tell his patient about teeth and their care?"

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Golf at the Canadian and Ontario Meeting



COMBINED meeting of the Canadian and Ontario Dental Golf Association will bring the 1927 Canadian convention to a rousing close. The tournament will be held on Thursday afternoon, May 19th, at the Thornhill Golf and Country Club, situated at Thornhill on Yonge Street. All are invited to participate. Those who do not play the game will be welcome to join the golfers (and duffers) at dinner at 7.30 in the club house.

Competitions will be held for the following cups:—

1. Canadian Championship—best gross score, open, donated by the Nova Scotia Dental Association;
2. Cup for Annual Competition (C.D.A.)—best net score, donated by Dr. George Kerr Thomson, Halifax, N.S.;
3. Cup for Annual Competition (C.D.A.), donated by Dr. F. Rous Mallory, London, England;
4. Ontario Championship—best gross score (O.D.A.), donated by Dr. F. Rous Mallory, London, England.

In addition to the above, the dental manufacturers and dealers have been very generous in supplying the committee with numerous and desirable prizes.

It will assist the committee if those wishing to attend this entertainment would register at the registration booth at the King Edward Hotel. We also wish to acknowledge our thanks to the following donors of prizes and hope they will join in the game with us: Ash-Temple Co., L. D. Caulk Co., Dental Co. of Canada, Goldsmith Co., Lavis, National Refining Co., and the S. S. White Co.

The fee, including green fees, dinner, prizes and entertainment, will be \$3.00. Join us and become acquainted as never before.

Local committee representing the officers of the Canadian and Ontario Dental Golf Associations:

G. V. MORTON, *Chairman.*

F. R. KNIGHT,

A. D. A. MASON.

The Dental Society of Western Canada

ALBERTA, SASKATCHEWAN, MANITOBA, COMBINED CONVENTION.



THE Dental Society of Western Canada meets in Edmonton, Alberta, May 25th, 26th and 27th, 1927. PLACE: MACDONALD HOTEL—the most commodious, comfortable and convenient place obtainable for this meeting.

ESSAYISTS.

Dr. Fred. Molt (Chicago)—Oral Surgery, mouth preparation, radiographic interpretation.

Dr. Robt. Gillis (Hammond, Ind.)—Full denture difficulties, articulation, regrinding, etc.

Dr. Fred. Conboy (Ont. Health Dept.)—Ethics, economics, practice building, etc.

Dr. W. I. Ferrier (Pres. Wash. State Assoc.)—Indication for and practical demonstrations of gold foil insertion.

TABLE CLINICS.

1. Dr. Murray, Camrose, Alta.

Jackson's removable orthodontic appliances.

2. Dr. Garvin, Winnipeg, Man.

Table Clinic (Microscopic)—Vincent's infection.

3. Dr. Kennedy, Banff, Alta.

Porcelain jacket crowns.

4. Dr. Allison Smith, Medicine Hat, Alta.

Cohesive gold foil.

5. Dr. Landing, Edmonton, Alta.

New plate material—substitute for rubber.

6. Dr. Gilchrist, Edmonton, Alta.

In charge of group on impression taking.

7. Dr. Manly Bowles, Winnipeg, Man.

Orthodontia problems.

8. Dr. Banning, Winnipeg, Man.
Nitrous oxide anæsthesia.
9. Dr. Croll, Souris, Man.
Tray making.
10. Dr. Vroman, Winnipeg, Man.
X-ray diagnosis.
11. Dr. LaFleche, Winnipeg, Man.
Porcelain restorations.
12. Dr. Forsythe, Winnipeg, Man.
Some suggestions in extracting and local anæsthesia.
13. Dr. Johnson, Winnipeg, Man.
Office records.
14. Saskatoon group.
Harper's Amalgam Technic.

In addition to the above, Clinics are to be given by members of the Profession from Calgary, Moose Jaw and Regina.

ENTERTAINMENT—For members and ladies.

EXHIBITS—Numerous and educative.

MOTORISTS' NOTE.

The Highway Department of our Provincial Government informs us that well over half the 200-mile road from Calgary to Edmonton is now surfaced with gravel, the rest to be completed by June 1st. In any case, all the bad spots are now done. A side motor trip to Banff from Calgary (90 miles) could be taken over gravel all the way.

American or B.C. visitors can obtain complete information on the Alberta roads south of Calgary, from Dr. L. T. Allen, of Lethbridge, or Dr. M. L. Moore, of Medicine Hat.

Dr. M. M. Dunsworth, Telger Building, Edmonton, will make hotel reservations for anyone notifying him.

We have already received congratulations on our succeeding in obtaining such a variety of excellent clinic material. Can you really afford to let these men come and go without benefitting from their experience?

LESLIE MCINTYRE,
Chairman of Publicity.

Retaining Financial Counsel

By R.W.B.

IT seems a logical thing to do—retain financial counsel. Most of us find our waking hours fairly completely consumed in prosecuting our own business—most of our energies and thoughts amply employed in becoming specialists in our own way of making money. And when we drop thoughts of business, we have little inclination to turn to the arduous task of becoming experts in finance.

And yet, logically, we should do so. We work hard for our income;

we spend perhaps the best years of our lives in accumulating cash; and yet, when we have gained it with much toil and self denial from pleasures, we do not always take care of it as we might.

It is a precious thing, this money we work for. Our bank balance or our investments owe us something; we have worked for them; will they work for us? Will they return us some compensation for what we have done in acquiring them?

Money should work for us. And it should work without constant management and worry and supervision. It should surely be like a trusted employee, able to look after itself!

But it is not.

If it takes knowledge and effort to build up a surplus, it takes knowledge and effort to make it work for us. It is subjected to many winds of fortune; to storms, or fair weather blowing up from sources unknown to us, unless we have the time to chart the financial heavens, and take daily readings of pressures and temperatures in many places.

And we have not the time. It is not enough to have worked for our competence? Must we nurse it and watch it in our hard won leisure?

I, for one, find myself too busy contesting the game of living, outstripping competition, keeping clients well served and pleased, to have much leisure for learning the art and practice of finance.

I have seen the fringes of it. I have glimpsed the vast knowledge, the unceasing watchfulness, the intricate investigation that goes to make up the functions of an Investment Banker. I know I have neither the time nor the facilities to enable me to know how best to make my money work for me. I am reasonably efficient in my own business. I have made myself a specialist by many years of labour. And in the course of my business I come across many matters of finance. But I am not a specialist in the art of investing. I know enough about it to know what that art involves.

I prefer to leave it to someone who does know the art. I retain financial counsel, to make my hard-earned cash earn more for me.

He is not one that merely buys and sells securities, without exhaustive study of the fundamentals involved in the industries concerned. He is not a worldly wise relative, who will form an opinion because he knows I expect him to know everything—but form it with any data. He is not “a friend in the city.” He is not one of those nondescript persons who profess to be “in the know.” Nor is he my accountant.

Nor, strictly speaking, is he “a man” at all; but, rather, a group of men. I have behind me, in choosing my securities, the aggregated knowledge and financial experience of a reputable organization.

They look after my investments, as a Doctor or a Dentist look after my health. They analyse them for me regularly, and advise changes when circumstances make it necessary. When I review the strength of my financial position, I feel that I am justified in my choice of Financial Counsel.

Give School Children Milk



MODERN research has upset many traditions and customs by which our grandparents let themselves be guided or misguided. But frequently modern research confirms the truth of teachings which have been passed on from one generation to another, declares the League of Red Cross Societies. Among these teachings is this, that the growing child needs milk. Cows' milk has been the food of man for thousands of years, but it has been left to the present generation to demonstrate how important a food it is. We are now in a position, not merely to say in general terms that milk is an excellent food, but that the addition of a certain definite quantity of milk to a school child's diet will increase his weight and height by so much in the year. A very interesting experiment in this connection has recently been made in England under the auspices of the Medical Research Council, by Dr. Corry Mann.

The field of this experiment was a colony of some 500 foundling boys housed in a model settlement about 11 miles from London. From 30 to 35 boys lived in each house, and they were carefully examined to exclude the possibility of latent or active disease. The boys were graded according to their physical condition, and equal numbers of the same age and grade were assigned as far as possible to the various houses. The investigation, which lasted four years, was started in December, 1921.

During the experiment, sixty-one of the boys received a basic diet, apparently sufficient for their needs. These boys made an average gain in weight of nearly 4 pounds a year, and in height of $1\frac{3}{4}$ inches. Forty-one other boys received the same diet, and in addition, a pint of fresh pasteurized milk every day. This latter group gained an average of nearly 7 pounds and grew an average of over $2\frac{1}{2}$ inches in the year. The most remarkable fact was that the boys who had received the extra milk could be picked out by a general visitor as being obviously more generally fit; and there was a complete absence of illness among them at a time when there was a higher sick-rate than usual in the other houses of the institution in which only the basic diet was given.

The first and most important conclusion to be drawn from this investigation is that though a given diet may contain proteins, fats and carbohydrates in suitable proportions and, apparently in adequate quantities, it may yet be deficient. The milk given as an extra to the boys did not greatly increase the fuel value of their diet, but it provided just those qualities which are found in milk and which are absent or inadequately represented in most other foods. Another lesson gleaned from this investigation is that, although a diet may by itself satisfy the appetite of growing boys, it does not follow that this diet is of satisfactory

quality. It is not enough to say that a given diet contains a sufficient quantity of food; we must also know that it possesses certain qualities to all of which we cannot yet give a name. They may be vitamins or they may be some unknown substances. What we already do know is that these substances which are to be found in milk, not only promote growth in height and weight, but also give that general appearance of good health which the most casual observer cannot fail to detect.

To every tale there is supposed to be a moral. But, alas, truth has compelled the recorder of this investigation to confess that the boys who received the extra milk ration were more often in trouble for minor offences against order than were the other boys. Nor were the milk-fed boys more proficient at school work. The shades of the elderly spinsters who conducted schools for our grandparents when they were children would, perhaps, hold up their bony hands in horror at a diet which is just asking for trouble. Yet we, of the present generation, rather like such trouble. We are, indeed, fully prepared to feed school children to a positively rebellious degree of vitality, provided they grow up perfectly healthy. The child who is "good" because he is anæmic and under-nourished is not a desirable object, and the white-faced girl who never strays from her mother's apron-strings, may be a little minx for all that.

An Interesting Case

[*This is a case from the practice of Dr. T. O. Forsyth, Winnipeg, and reported by Dr. W. W. Wright.*]

ISTORY:—Patient aged 32 years. Female. Married. Two children. Living in country town. Suffering from severe pains in the head for a period of three years or more. These were getting more severe and occurring at more frequent intervals until, at the time I saw her, she would have these pains nearly every week, and of such intensity that she would be practically out of her mind. She had been to several doctors, and according to her story they suspected her of having a tumor of the brain. She was eventually advised to have her teeth x-rayed.

DIAGNOSIS.

This part is interesting in that she had had radiographs taken with the ordinary dental films, which revealed that all her teeth were in good condition and apparently all vital. Her permanent cuspids were missing, but she said they were removed when she was about 20 years of age because they were decayed. This seemed to give her a clear sheet as far as her teeth went. I then suspected a cyst in the upper jaw which might cause pressure in that part. I had a large film taken straight

down through the nose. This revealed two impacted cuspids lying in the roof of the mouth, so far distal that the apices were opposite to the lingual roots of the first molars. These teeth were very close to the median line and directed upward and forward. This condition of abnormal position accounts for them not being seen in the small x-rays. Evidently teeth lost at 20 years were deciduous cuspids.

TREATMENT.

These teeth were removed under Novocain anæsthesia, both at the same time. I found them covered with a thick layer of dense bone and having pushed the floor of the antri upward to accommodate themselves. They were quite difficult to remove, due to their position. The removal was accomplished by cutting each tooth into three sections with a drill after the bone was removed over the centre of the teeth. The centre section was then easily elevated out into the mouth. The other parts were teased out with small excavators.

The flaps were then sutured in place and healing began by first intention. The patient was kept in the city for ten days, when she was allowed to return home. The following day after the operation she remarked that the heavy feeling of fullness had disappeared.

PROGNOSIS.

The patient had two attacks of pain within the next ten days, less severe than before. A letter received from her five months later stated that she was feeling fine and that the pains in her head had not recurred.

Modern Teachers and Health Education



SCHOOL teachers no longer read "from page 14 to page 21" as the afternoon's hygiene lesson, the way they used to do when fathers and mothers were children.

Nowadays they make the story of healthy boys and girls so human that the youngsters not only forget to dream out of windows, but look forward to seeing who can show the most improvement in daily health and appearance.

The kiddies are now given such characters as "Food Fairies," in educational plays and games. Other more interesting devices are given them to encourage daily practice of the health lessons. While the teacher nowadays tells her children a story full of human interest, the children themselves are very much a part of the lesson, acting out the characters as the teacher tells about them.

The modern school teachers play a large part in the establishment of medical and dental health habits in the lives of the boys and girls in their care.

Dominion Government Grants Five Thousand Dollars and the Canadian Red Cross Two Thousand Five Hundred Dollars to the Canadian Dental Hygiene Council

E. A. GRANT, D.D.S., SEC.-TREAS., C.D.H.C.



THE service rendered to Canada and its citizens by the Canadian Dental Hygiene Council during the last few years, has at last been officially recognized by the Dominion Government through the granting of Five Thousand Dollars (\$5,000.00) to assist in this organization in further promoting the work of Preventive Dentistry and Mouth Hygiene. This amount was placed in the Supplementary Estimates by the Minister of Health, and after approval by the Cabinet Council was passed by the House of Commons just before the session ended. The grant is the culmination of three years' effort by the Executive of the Council to secure support and recognition from the Government. A request for Ten Thousand Dollars was first made in 1924, and renewed each year without result, and although some disappointment is felt that only half the amount asked for was given this year, still the Executive are greatly encouraged and grateful for this addition to their funds. An interesting fact in connection with this grant is that, as far as we know, it is the first time on record that the Federal Government has given monetary assistance to an organization for the specific purpose of promoting dental health education.

In coming to their decision, the Government were no doubt influenced by the knowledge that only a few months ago the Canadian Red Cross had approved the work of the Council by making a contribution of Two Thousand Five Hundred Dollars (\$2,500.00). This endorsement by such an important body as the Canadian Red Cross, demonstrates convincingly their interest in Preventive Dentistry, so much so, in fact, that the service which the Council is carrying on for the people of Canada is very much in line with the peace time programme of the Red Cross.

At the beginning of 1927, the Executive of the Canadian Dental Hygiene Council drew up a plan of activities as follows:—

PROGRAMME OF ACTIVITIES.

To provide official headquarters as a clearing house for all Oral Hygiene work.

To provide a library of books and pamphlets on Oral Hygiene, these to be sold or loaned.

To provide a catalogue of lantern slides, moving picture films,—slides and films to be rented.

To provide outline lectures, charts, mottoes, cards and pamphlets for the promotion of Oral Hygiene work.

To supply mouth health material suitable for publication in the local press.

To arrange, if possible, to have an official representative of the Canadian Dental Hygiene Council at the annual meeting of each Provincial Society, to present a report of the progress of the Canadian Dental Hygiene Council.

To co-operate with all recognized Provincial Health Organizations and, if possible, to assist them with the services of our Field Officer.

To endeavour to have established a properly organized Dental Division in the Department of Health of every Province in the Dominion.

To arrange a broadcast of Dental Health material throughout the Dominion.

To syndicate Mouth Health material to the press.

To provide special Mouth Health educational material for Normal School students, nurses in training, etc.

To organize Dental Health Service to immigrants, through Health Departments and their organizations.

To enlist the interest and support of Societies or Organizations such as School Trustees, Medical Health Officers, and Women's Institutes, in Preventive Dental work.

To have an official representative of the Canadian Dental Hygiene Council available to attend the general meetings of all National organizations doing health work.

It was estimated that to carry all these plans into effect would require a budget of Ten Thousand Dollars. This, exclusive of the salary of the Field Officer, which is provided by the Canadian Oral Prophylactic Association. The problem of raising this money has been greatly facilitated by the grants from the Red Cross and the Dominion Government. These together provide Seven Thousand Five Hundred Dollars. The remaining Two Thousand Five Hundred Dollars we hope to obtain from Dentists, Dental Societies and other organizations and individuals.

It is hoped that some time in the near future, a plan may be worked out of providing dental education and care in sparsely settled parts of the country, remote from any centre where they can secure the services of a Dentist. The people in these unorganized districts are badly in need of such service; many of them are newcomers to Canada and have not had any of the advantages of the educational work already done in organized communities. Some such plan might possibly be worked out in co-operation with the Red Cross, who have already established many Outpost Hospitals and Health Centres in these areas. Thus the

Health Service at present given might be rounded out by providing some form of dental treatment, as well as education on Mouth Health and the Prevention of Dental Disease, carried on through the Oral Hygiene Committees of the various Provinces. This work would be capable of accomplishing much good.

To provide incoming new Canadians with a knowledge of the importance of Oral Health, and if possible, to give some practical assistance along these lines, is a plan that has been given a great deal of consideration; the difficulty has been to find a practicable way of carrying this plan into operation. Once again the Red Cross offers an opportunity through their Port Nurseries, and it is hoped that some feasible method will soon be worked out to enable the Canadian Dental Hygiene Council to put into effect this very humanitarian effort, which will be productive of far-reaching beneficial results.

Central Headquarters have been established at 86 Bloor Street West, Toronto, and the staff organized. Educational material has been collected, and this is being added to. General organization work is being carried on, and plans are maturing for a Canada-wide programme of Oral Health activities, under the auspices of the Oral Hygiene Committees of the various Provinces. Suggestions for the extension of the programme of the Council are invited from Oral Hygiene Committees, health organizations, and health workers, so that the Council may broaden its activities to accomplish the greatest good to the greatest number.

A Plea From Massachusetts



THE Massachusetts Department of Public Health asks the co-operation of every practising dentist in Massachusetts in furthering its new programme for the prevention of tooth decay. Any dental hygiene programme is in the last analysis dependent on the practising dentist. Health authorities, specialists, doctors, nurses and dental hygienists may unite in an effort to teach the public certain facts now known concerning teeth, but if they are not backed by the dentists, the whole programme will fail and the public will be confused.

In May, 1926, the Department of Public Health, with the aid of its Dental Advisory Committee, drew up a new policy for Dental Hygiene work. The main body of its policy is based on the operating policy used at Forsyth Infirmary. Statistics have proved that the Forsyth programme is actually getting "results," saving thousands of teeth by treating them before decay had started. It is the responsibility of the State Health Department and the dental profession to spread this message to all communities so that old inefficient methods may be abandoned and a new hold taken on the problem.

There are certain definite facts concerning teeth that the State Department has made the basis of its working programme. These are:

1. The importance of dental and nutritional care during pregnancy, infancy and early childhood.
2. The relation of proper nutrition to tooth development.
3. The importance of dental treatment for deciduous teeth.
4. The advantages of filling fissures and pits in permanent molars immediately after eruption and before decay starts.

These same facts form the basis of the resolutions passed by the Massachusetts Dental Hygiene Council and resolutions which have been adopted by fourteen State Societies, ten Local Societies, American Dental Association, Canadian Dental Association and Commission on Oral Hygiene of the International Association.

Printed material has been developed to cover this information in a simple direct way. Charts showing developing teeth and fissures to use in lecturing to adults have been made. A delineascope film for children telling the story of tooth development is now ready for use in the schools.

With this as a foundation a working programme has been developed. This programme falls into two sections, what we advise for the towns now conducting dental clinics and what we advise for towns or private organizations contemplating work.

There are around 160 dental clinics now running in this state. The majority are attempting to treat a large group of children with no definite age limit or policy for trying to make the programme preventive. The work is spread out and each year the problem is what it was the year before. We recommend to these communities:—

1. That they establish a seven-year age limit. (In most cases there are enough children in this group to keep the dentist busy throughout the year—and yet they have been trying to cover all eight grades).
2. That they open the clinic to preschool children. (Concentrating at first on the permanent molars and, as the programme develops, taking care of the deciduous teeth).
3. That the dentist have the following operative policy:—
 - a. Fill all fissures and pits in first and second teeth.
 - b. Do no root canal treatment or conservative pulp treatment.
 - c. Extract all teeth not amenable to simple fillings. (Fill only such cavities as can be done without danger of pulp involvement).
4. Extend clinic service to prenatal cases. (This is not possible in many cases now, but it is an objective to work for).

This will mean that our clinics, instead of doing a slipshod piece of reparative work, will operate on the best preventive programme now known to the dental profession.

To the community contemplating work we advise much the same

thing. If town money is to be spent we do not recommend that clinics be established. It should be spent for educational work either through a travelling dental hygienist or a permanent dental hygienist.

On the other hand private organizations may well undertake the giving of clinic service. To such organizations we recommend:—

1. An operating policy similar to the one just discussed.
2. The work done by a local travelling dentist.
3. The entire cost, as far as possible, paid by the parent.

It is the first section, the recommendations to clinics that is our programme for the present. This has been presented to the staff members of the Division of Hygiene, to the district health officers, to a group of Parent Teacher Association delegates, to two groups of Maternity and Child Hygiene nurses, at four Child Hygiene Conferences, and to twenty individual towns.

We are trying to reach all the health authorities in the state and the prominent members of all local communities. It is at this stage that we appeal to you for your active co-operation. Nothing is more discouraging than to tell a nurse or a parent that certain treatment should be given new molars or badly decayed first teeth, and have the family dentist say that it should not be done. It happens frequently. We are confident that a thorough explanation of the programme will show that we are working toward prevention, that what we recommend is what we know to be the best treatment for a large group, not what may be done in private practice.

Once this is thoroughly understood we know that every ethical dentist will want to join forces with us and push a programme that will accomplish in a short time what years of the other policy would never accomplish. We have passed the stage of propaganda—our people know that teeth are important. Now is the time for slow steady work at the foundations. We ask your help.

GEORGE H. BIGELOW,
Commissioner of Public Health.

Obituary

DR. ALPHONSO EDWIN HENNIGAR, of Calgary, passed away suddenly on Monday, March 7th, 1927, at the age of forty-five years. For the greater part of two years he had been unable, except at intervals, to attend to his practice.

Dr. Hennigar was born at Chester Basin, Nova Scotia, and received his general education there. He engaged in business for several years, and later entered the Baltimore College of Dental Surgery. He graduated in 1909, returning to Halifax, Nova Scotia, to practise his profession.

In 1912 he commenced practice in Calgary, giving special attention

in his practice to exodontia. As a member of the Board of Directors of the Alberta Dental Association he did valuable work, having served as Registrar, Vice-President and President. His passing is a distinct loss to the Dental Profession of Alberta, and also to the city of Calgary, of which he was a public spirited citizen.

He is survived only by his wife, to whom he was married in Calgary in 1921.

—J.W.C.

For the Child That Tires of Milk

THE clever mother has learned that there are many ways of disguising milk so that the child will not tire of it. America's favourite dessert, the ever popular ice cream, can well be used as a means of making milk acceptable in a child's diet.

"For children just entering school, plain ice cream should be given, made largely with milk or light cream. Fruit milk sherbets are particularly good and can be quickly and easily made at home. In fact, the children themselves could easily make sherbet. Let them make lemon milk sherbet, freezing it in a tin baking powder or other closely covered can in a pan of chopped ice or snow, mixed with about one-third the quantity of salt.

"Twist the can in the ice mixture and scrape down the sherbet from the sides of the can with a silver knife from time to time as it freezes. The children will greatly enjoy doing this, and consequently will eat it with an added zest."

Other mothers find that to flavour the milk with a small quantity of fruit juice or chocolate has the desired effect, or even giving the child a straw through which to drink the milk—the straw turns a pesky duty into a playful task.

The Value of Human Life

LIFE insurance companies estimate that the present worth of the net future earnings of the average man at the age of 18 is about \$29,000. If, on the other hand, the parent belongs to the \$5,000 income class, at the age of 18 his future earnings will net \$34,000. After the age of 70 the economic value of the average person is negative, statisticians find, because earnings cease and the cost of living continues as at previous ages.

"The money value of the net future earnings of all persons in the

United States is nearly fifteen hundred billion dollars, or more than five times as great a capital as the total of all national wealth figured in real property, live stock, machinery, agricultural and mining products and manufactured goods of all kinds," states Louis I. Dublin, statistician for the Metropolitan Life Insurance Company of New York.

"Sickness and premature death are destructive of human capital on a large scale, because they interfere with production and cut life short," adds Dr. Dublin. "Every year, sickness alone costs the people of the United States in excess of two and a quarter billions of dollars in wages lost, and in medical, nursing and hospital care. Premature death on the most moderate basis costs as much more."

On the basis of the above figures, health authorities are urging people to give more thought to the health of their children, to building strong constitutions, giving them the right foods, exercise, and seeing that they get plenty of sleep in their early years to build up a reserve with which to meet future responsibilities.

Improved Health Facilities in Rural Districts



FINANCIAL difficulties are not the only incentives for the migration of farmers' families from the old homestead to permanent life in our great cities. People are coming to the city because they can find shorter hours of work and better health facilities.

There is an age-old debate as to whether living conditions are better in country or in city. Consolidated schools, improved transportation, newspapers, magazines, radio and improved living conditions are supplanting the pioneer modes of living on the farm into more and more desirable places to live and to raise children under healthy conditions.

TEACHERS SPREAD HEALTH KNOWLEDGE.

Thousands of school teachers are each month asking for material which they can use in teaching the children of the nation the value of such protective foods as milk, leafy vegetables and fruit, encouraging them to make sleep, the care of the teeth and cleanliness a daily habit, not only in the city but in rural schools. However, there is a need of encouraging adults in rural communities to have physical examinations and to realize that the saving they make in evading a physician or dentist is costly to them in later life.

Public Dental Health Education

"The public has decided it wants health talk and means to get it! The lay press is the most powerful medium of instruction for the public in health matters. We must do our best to secure its co-operation!"—Sir Thomas Horder.

IN this department each month will be published short articles suitable for use in the public press. The material has been authorized by the Oral Hygiene Committee of the Ontario Dental Association and members of the profession may feel free to arrange for its publication in the local papers or magazines.

DENTAL HEALTH PILLARS.



SUGAR and spice and everything nice" may be what little girls are made of, but certainly such a diet would never build strong, healthy little girls and boys.

With the child properly started on the road to health, through the mother's careful dietary habits, there must be no slackening in this regard, if it is to continue safely along the way.

Proper diet, from the nursing period up through adolescence, has much to do with teeth and health. It is now that nutrition plays the chief role, in the formation of healthy tooth tissues, or in their early degeneration and decay. But hand in hand with this must go the maintenance of cleanliness through training the child in the best and most thorough mouth hygiene.

The notion that the deciduous teeth, being replaced by successors, can therefore be allowed to go without the care necessary to keep them sound and comfortable is most mischievous. Too early loss of these little teeth, from any cause, leads to disturbances of the permanent dentition with consequent general disorders.

It would be better for the young child not to know the taste of sweets too soon, thereby avoiding their craving at this early age, when they may be harmful both to the teeth and body health. Plain, wholesome foods should be the rule, including plenty of milk which, because it is both rich in nutrient qualities and easily assimilated, is the perfect food for the young child.

Parents should be reminded too, that the child should be brought to the dentist, at about three years of age, and thereafter at stated intervals. Preferably the first visit should be made before there are any cavities, in order to establish the confidence of the young child in these services. Much of the dread of dental treatment, with its consequent neglect of mouth conditions among adults, has arisen through recollections of a painful first visit during the tender years.

It may be further noted that the susceptibility to tooth decay is greatest in youth, most cavities appearing before the twenty-fifth year, and that the period of adolescence and, between the twelfth and sixteenth years,

marks the high-water mark of dental decay,—due to the rapid physical changes demanding an increased calcium supply present in the diet.

Diet, mouth hygiene and systematic dental examinations are the three pillars of dental health.



HOW TOOTH-ACHE STOPS.



IN tooth-ache we find a fight progressing between the invading organisms and Nature's little warriors, the phagocytes.

Then what decides the tide of battle?

Should the invaders not have made too great headway through the breach in the pulp wall, the chances are that the little warriors would win the day, and the teeth get well, especially if the tooth cavity were cleansed of all decay, by this means destroying the hosts of the invading organisms. Nature needs assistance at times, you see.

But should this not be forthcoming, the attacking organisms pour through the breach in increasing numbers and discharge their poisons, while Nature, making a desperate effort to stem the tide, rushes her little warriors into the conflict in such vast numbers as to prove her own undoing. In this wise: that the tiny blood vessels within the pulp chamber become congested, resulting in an increased pressure that flattens the thinly-walled veins at the constricted opening which serves as both entrance and exit to the pulp chamber. Consequently, the flow of blood outward is progressively slowed up and ultimately stopped, and pulp strangulation results.

So the pulp dies! and the gallant band of little warriors is annihilated; then, with the pulp death the pain ceases. But is the danger past? Not at all!

For the invading hosts, finding in the dead pulp ideal conditions of heat and moisture for their propagation and growth, multiply exceedingly, and pour through the exit of the chamber into the body tissues carrying their poisons, as well as other products of decomposition of the lifeless pulp.

Thus, coursing through the body fluids, they become at once a menace, not only to the health and life of the tooth, but of the individual as well.



THE "GUM-BOIL."



OUR child has come running to you one day—suffering pain—and has pulled aside his lip to let you see an angry lump on his little jaw.

And, since it was just as sore as a boil to touch, you called it a "gum-boil."

Or, possibly he had not complained of any soreness then, but one day while scrubbing his teeth, you noticed this lump with a little opening

in the centre, reminding you for all the world of a miniature volcano. And from the "crater" was running a thick yellowish substance, which you knew to be pus.

Now, what had caused this? Just one thing—a dead pulp.

Nor have you far to seek for the offender, since usually you will find that the tooth just over this sore is badly decayed or broken down, with perhaps just the stump remaining.

Then what should be done? For, of course, this condition should receive prompt treatment.

Should the tooth be not too badly decayed, your dentist may think it is wise to try and save it; but more often it should be extracted after the inflammation has pretty well subsided.

Following this treatment, the gum heals over and you congratulate yourself that no harm has been done.

But consider: already serious disturbances may have resulted, in that the disease process may have destroyed the permanent tooth germ beneath, to say nothing of the train of evils from the premature extraction of the offending tooth, and from the drainage of the pus into the system during the progress of the disease.

How much better, then, had the tooth received attention during the early stages of tooth decay!

* * *

TOOTH STRAIGHTENING.



OUR child has "crooked teeth" and, wisely, you are thinking of his future and not content to let this condition persist.

Irregular teeth are, in a sense, a deformity, and often mar one's natural attractiveness, and indeed, in many instances, may also lead to general systemic disturbances.

Now, can anything be done by way of correcting this mal-occlusion?

A great deal! especially if treatment is commenced while the child is still young.

Each case, of course, presents its own problems with their special solutions, but in the main, your dentist, or the orthodontist who specializes in this branch of dentistry, will correct this condition by making use of metal bands and bars which your child would need to wear continuously for some little time, the period of wearing being determined by the severity of the case in hand.

But you wonder, perhaps, how a tooth can be moved when fully erupted, encased as it is in dense and seemingly unyielding bone.

However, it is simply a matter of making use of a natural physiological process whereby bone tissue is resorbed and broken down in advance of a properly applied and persistent force, thus permitting the tooth to move bodily through its supporting bony structure.

Then is tooth straightening a painful process?

Not in the least, where too rapid movement is not attempted.

And when should it be commenced?

Many operators like to take the case in hand while the child still has the temporary set and generally at about the eighth year, when success is more easily and quickly secured.

Then, of course, where treatment is delayed, the case becomes progressively more difficult of correction because the muscles and tissues are becoming more or less fixed. When early adult life is reached, "tooth straightening" is not advisable except in the very simple cases.

* * *

"TOOTH IS LONGER"



OUR child had tooth-ache one night and you were able to relieve his suffering by applications of oil of cloves to the cavity; and when the pain had subsided, you congratulated yourself that the trouble was ended.

But in the morning he awoke to find that the tooth was sore to bite upon, and longer than the others, so he said.

Now he was right, for in a sense the tooth *was* longer than its fellows. Just what happened?

Each tooth is suspended in a soft tissue sac which acts as a cushion between the tooth and its bony socket, breaking the jar when the tooth is in use.

And the inflammation which caused the tooth to ache has spread from the pulp to this sac (or pericementum) which is richly supplied with blood vessels; thus, with the accompanying rush of blood, the sac has become swollen, and so thickened.

Actually then, it does lift the tooth in the socket a trifle, permitting it to hit the opposing tooth before the others come together.

Now, of course, this needs attention, not only because of the dangerous sequelæ from the inflamed condition if allowed to progress further, but also for the reason that Sonny will do all his chewing on the "well side," in his endeavour to avoid using the sore tooth.

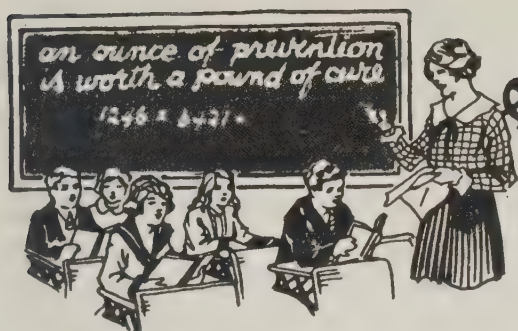
This, continued long enough, will form a habit making for a one-sided muscle development and leaving the teeth on the "sick side," because of this disuse, more prone to decay.

Further, should one or more of these deciduous teeth be allowed to remain in such condition as to cause pain when used, the food will naturally be bolted and a harmful habit formed which it may be difficult to correct later.

Be Pleasant!



IF you have not slept, or if you have slept, or if you have a headache, or sciatica, or leprosy, or thunderstroke, I beseech you by all the angels to hold your peace, and not pollute the morning, to which all the housemates bring serene and pleasant thoughts, by corruptions and groans.—*Emerson*.

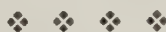


School Dentistry

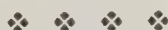
This Department is Edited by

EDMUND A. GRANT, D.D.S

Director of Dental Services—Department Public Health, City Hall, Toronto.



We are anxious to receive for publication in this Department reports of work carried on in School Dental Centres anywhere in Canada. Papers on any phase of Pedodontia would also be welcome.—E.A.G.



The Teeth*

Q. When do the teeth begin to grow?

A. Seven months before the baby is born.

Q. Has the mother's health then an important effect on the growth of baby's teeth?

A. Yes, the growth of good teeth depends on the mother's health, and the mother's health is dependent on good blood, and good blood on pure air and proper nourishment.

Q. What form of feeding of the baby produces the best teeth?

A. Breast-feeding for nine months.

Q. When do the baby's teeth begin to erupt?

A. About the sixth month, when the two lower front teeth appear first.

Q. For the teeth to develop what form of exercise is necessary?

A. Exercise of the jaws.

Q. How is exercise of the jaws obtained by the baby before the teeth appear?

A. By the action of the jaws in sucking. The act of suckling in breast-feeding is different from that in bottle-feeding, and is the correct exercise.

Q. What is the action of sucking a teat?

A. It deforms the jaws and does not produce the correct development of the jaws.

Q. What effect has the dummy on the jaws and teeth?

A. The use of the dummy causes deformity of the jaw bones, giving

*Extract from "The Hygiene of Infancy," by S. T. Beggs, M.D., D.P.H., Medical Officer of Health, Middleton, Manchester, England.

a narrow V-shaped palate, with the result that there is not enough room for the teeth. They appear irregular and project outwards. Mouth breathing is induced, and adenoids and enlarged tonsils develop.

Q. Once the teeth appear how should the jaws and teeth be exercised?

A. By gnawing, biting and chewing. Begin by giving the baby a bone ring or a piece of bone to gnaw and bite. Gradually get on to hard crusts and crisp food.

Q. What is the effect of pap-feeding?

A. (1) The jaws and teeth are not exercised, with the result that the teeth decay and the jaws do not develop; (2) saliva is not mixed with the food and indigestion occurs, with loss of weight and wasting; (3) nose obstruction and mouth breathing are set up owing to the deformity of the jaws, and adenoids result.

Q. Has the effect of soft food on the teeth and jaws been shown by experiment?

A. Yes, it is found that if young animals, such as puppies, are fed on soft food their teeth decay and their jaws do not grow.

Q. What is the cause of decay in the teeth?

A. Soft food fermenting between the teeth, forming acid which destroys the enamel.

Q. What happens as the decay progresses?

A. The hole in the tooth gets filled with food which ferments and becomes the breeding place for germs of serious diseases.

Q. Is decay in the teeth dangerous to health?

A. Yes, as it gives germs of dangerous diseases, such as consumption, fevers, and blood-poisoning an opportunity of infecting the individual with these diseases. As decaying animal and vegetable food in an ashpit breeds disease, so does decaying food in a tooth cause disease.

Q. Is it important to prevent decay in the temporary teeth as in the permanent teeth?

A. Yes, because decay in the temporary teeth affects the permanent teeth and interferes with development of the jaws and the proper nutrition of the body.

Q. When do the temporary teeth appear and how long are they required?

A. They erupt from six months up to two years. They are required until the permanent teeth erupt.

Q. When do the first permanent teeth appear?

A. The first to erupt are the first double teeth, in the sixth year. These are the most important teeth to preserve. (They are called the sixth-year molars.)

Q. How is decay of the teeth to be avoided?

A. (1) By the expectant mother attending carefully to her own health; (2) by breast-feeding; (3) by proper exercise of the teeth in the child; (4) by preventing food collecting between and around the

teeth; (5) by keeping the teeth clean; (6) by open-air life and the right nourishment of the child.

Q. What does exercise of the teeth imply?

A. Using hard food and chewing thoroughly.

Q. How is the food to be prevented collecting between and around the teeth?

A. By using a tooth cleansing food at the end of each meal, such as a raw apple, and rinsing the mouth afterwards.

Q. How should the teeth be cleansed?

A. By brushing with the toothbrush, first the outer surface, then the inner surface and then the grinding surface. Brush the upper teeth downwards and the lower teeth upwards by rotating the brush placed flat on the teeth.

Q. When should the teeth be cleaned?

A. Every day before going to bed and on rising in the morning.

Q. In selecting a toothbrush, what is required?

A. The tufts of the bristles should be well separated from each other, and they should end in points so as to get between the teeth.

Book Review

PRINCIPLES OF EXODONTIA AS APPLIED TO THE IMPACTED MANDIBULAR THIRD MOLAR.

By George B. Winter, D.D.S., F.A.C.D., Author of "Exodontia"; Professor of Exodontia at Washington School of Dentistry; formerly Teacher of Exodontia at Extension Course of Columbia University, New York. Illustrated. American Medical Book Company, St. Louis, Mo., 1926. Price, \$22.50.



THE author has succeeded to a marvellous degree in making a complete classification of the different types of mandibular third molars, and also to standardize a definite technique for their removal. The labour and research necessary to compile the intricate and varied modifications of what has been considered a comparatively small field have required persistent patience, imagination and observation.

A very highly specialized technique is presented, of which the author is a master, but it is questionable if a large percentage of dentists would find it possible or desirable to attempt to practise it in its entirety.

To those who are interested in the extraction of the lower impacted third molar, the chapter on "Radiographic Interpretation" is invaluable, and is one of the greatest contributions in this line.

The work is most clearly and extensively illustrated, and the student and exodontist will find it a very valuable book of reference and study.

E. W. Paul.

DIRECTORY of DENTAL MEETINGS & OFFICIAL ANNOUNCEMENTS

*Dental Associations are Invited to use this Department Freely for
Announcements of Meetings.*



DIAMOND JUBILEE CONVENTION—THE CANADIAN DENTAL ASSOCIATION — At the Sixtieth Anniversary of The Ontario Dental Association, King Edward Hotel, Toronto, May 16th-18th, 1927.

THE DENTAL SOCIETY OF WESTERN CANADA—Edmonton, Alta, May 25, 26, 27, 1927.

THE AMERICAN DENTAL ASSOCIATION—Detroit, Mich., October 24, 25, 26, 27, 28, 1927.



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*Oral Health will be pleased to Receive Additions or Corrections that Directory
of Names May be Kept as Accurate as Possible.*



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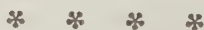


MARITIME PROVINCES.

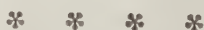
DR. G. A. BURBIDGE, Dean of the School of Pharmacy, gave a very interesting address on "Drugs" before the Halifax Dental Society at their March meeting. Dean Burbidge paid particular attention to the question of standardization of drugs and the necessity of a Canadian authority. He referred to the large increase in remedies compounded by the various manufacturing houses. Many of these are of distinct value to both the physician and the patient, because of the skill and care with which they are put up. Others, because of the extravagant claims made on their behalf by the manufacturers, should not be used.

The next meeting of the Society will be held in April, when Mr. J. A. Rutledge is to discuss the question of "Dental Jurisprudence."

The December meeting, which was addressed by Drs. McLaren and Birt on the subject of "Focal Infection," and the February meeting, when Dr. Faulkner, of the Crown and Bridge Department of Dalhousie Dental School, spoke on Bridgework, were most interesting to those in attendance.



Mr. J. A. Tupper (Dentistry '28) has recently been elected President of the Dalhousie University Athletic Club, for the season 1927-28.



The Annual Convention of the Nova Scotia Dental Association is to be held in Sydney this summer, on the 19th, 20th and 21st of July.

This will be the first trip of the Association to Cape Breton in many years, and as an interesting programme both of entertainment and papers is being prepared, it should be a very notable one. Sydney as a centre for the Convention offers particular inducements to the man who is planning a summer trip in his car.

* * *

Dr. Angela Moriarty, graduate in Dentistry at Dalhousie in 1924, and daughter of Dr. J. M. Magee, of St. John, leaves shortly for the Philippines, where she will be engaged in research with her husband on the problem of the spread of malaria.

J.S.B.

* * *

QUEBEC.

MONTREAL DENTAL CLUB.



THE thirtieth annual meeting of the Club was held in the Mount Royal Hotel on Monday, March 14, 1927, the retiring president, A. N. Jenks, presiding.

The report from the Chairman of the Insurance Committee, Dr. Henry, indicated that the group professional liability insurance is being taken up. Dr. Chas. Barr outlined the new school clinic work being undertaken in Verdun.

Dr. Jenks reported for the Book Selection Committee, which is working in connection with McGill Library. He reported gifts of books from the following: Drs. F. H. A. Baxter, Somers, Stevenson, Thornton, and from the widow of the late Dr. J. H. Springle, a dental treatise by Dr. Spooner, published in 1836.

Dr. Bushell, the Secretary-Treasurer, gave a highly satisfactory report of the year's activities.

The officers returned for next year are:

President—Dr. D. P. Mowry.

Vice-President—Dr. A. L. Walsh.

Secy.-Treas.—Dr. A. D. Crowe.

Committee—Drs. F. H. A. Baxter, R. Cleveland, E. Laurin, W. C. Bushell and A. N. Jenks (ex-officio).

The old-time question night was revived with vigour, to the profit of the large meeting.

A. N. J.

* * *

MONTREAL DENTAL ASSISTANTS' ASSOCIATION.

The Dental Assistants' Association of Montreal, Canada, held their monthly clinic on March 5th, in the Medical Building of McGill University, Montreal.

The speaker of the evening was Dr. F. G. Henry, Professor of Materia Medica and Pathology of the Dental Faculty of McGill.

The subject of his lecture was a very interesting one for Dental Assistants, viz.:—"Drugs, their Use in Dentistry"—including their actions on the tissues, and also their general and physiological action; formulas of mouth washes, acid and alkaline, tooth powders and tooth pastes.

The meeting was well attended by the Assistants of the Society, and the members feel that their efforts are appreciated by the Profession in general. The progress of the Association so far is very satisfactory, and it is anticipated that eventually the Dental Assistants all over the Dominion will meet in this work for their mutual benefit.

The regular monthly meeting took place at the Universite de Montreal on March 21st. The speaker of the evening was Dr. J. A. Pinault, Professor Prosthetic Dentistry of the Universite de Montreal, who spoke on the "Help of a Dental Assistant in Prosthetics."

* * *

ALBERTA.



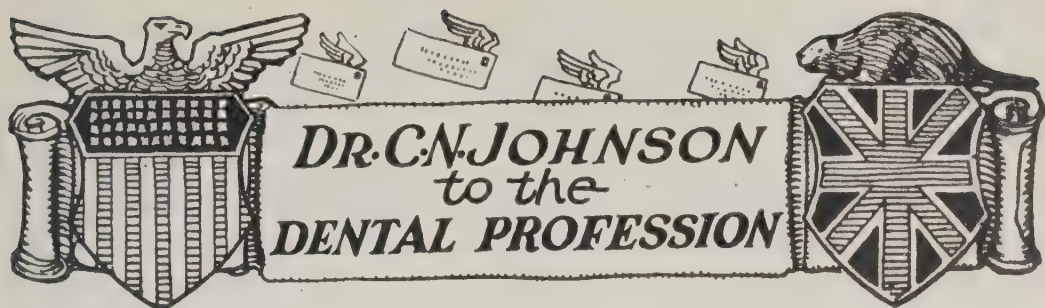
HE graduation into Dentistry at the University of Alberta this year of a senior class of seven men, is an event of importance in the history of Dentistry in Western Canada.

Less than fifty years ago the first dentist registered in the North West Territories, on the payment of five dollars and the production of a signed statement that he had spent three months in a dental office.

The University of Alberta now presents to the Dental Profession the first dental graduates in Canada, west of the Great Lakes, these men completing a five year course in Dentistry. From all accounts they will do credit to the school from which they come, and fill a worthy place in Canadian Dentistry.

The Dental Students' Club of the University recently held its second annual banquet, under the able chairmanship of Mr. John W. Gerrie ('27), to commemorate the event. About sixty undergraduates and graduates met at the MacDonald Hotel, and listened to speeches by Dr. Tory, the President of the University, Dr. Bulyea, head of the Dental Department, and others.

One could not help but feel the importance of the occasion. Western Canada will, in the not far distant future, be the home of a large population, and this Department should become the centre of dental education, to supply to a great extent the fast growing needs of the Prairies.



A Failure

I HAVE suddenly had forced on me the realization that I am a failure. I had blindly gone along to this time of life under the deluded idea that at least in some things I had succeeded, but now I find it is all a mistake—I have been a failure without knowing it. The realization came in a peculiar way. Of late I have been reading the lives of many eminent men, and I find that I am utterly lacking in the characteristics which seemed to contribute to their greatness. I was never the kind of a boy that most of these men were. It is a keen disappointment to me, but I suppose I must face the facts.

To begin with I never took care of horses in a livery stable (though I confess I should have greatly enjoyed that kind of work). I never crawled under a circus tent when the showman wasn't looking—in my callow days I foolishly thought it might be wrong to do this, and now I see how mistaken I was. I never taught school in a rural district—that was one job I always vowed I never would do. I never shined shoes for a living, and worst and most hopeless of all, I never sold papers. It will thus be seen how utterly inadequate were my boyhood activities as a preparation for success. The only occurrence that gives me the least satisfaction or the smallest claim to distinction is that on one occasion I stole some apples from an overladen orchard, but I was so conscience-stricken over the affair that it didn't help much.

Another great limitation to my youthful development was the fact that I never liked to fight, and as I grew up in school I spent most of my energy in separating other boys who were fighting. I always enjoyed an athletic contest where good feeling prevailed, but it is humiliating to acknowledge that any display of temper between boys in a fight invariably distressed me almost to the point of faintness. And yet I can watch a series of boxing matches all evening where the contestants display good will by shaking hands before and after the match, and where it is an exhibition of skill, generalship, and quick thinking. If a little blood is spilled in the contest, it is not shocking to me so long as it is spilled with good humour.

Most of the great men I have been reading about seemed to have, when boys, all the qualifications in which I was lacking, and this has convinced me that I can never make any claim to greatness. I saw a

remark the other day, the logic of which I think I can understand. A man said: "If I had not been such a good boy, I would have been a better man." Most people may not see the connection, but there is a subtle something about that remark which appeals to me.

And yet—if I may be permitted to project the personal note still farther into an article that is already much too personal—I would like to say that of all the abhorrent things, to me the most abhorrent of all is to be called a good man. An ordinary man like I am who permits himself to be called good is a fake and a falsifier. No real flesh and blood man can ever achieve goodness—it is not in him. The utmost he can do is to achieve honesty, and by the same token to be called honest is no mean distinction. Let us not as men pretend to be something which we are not, and which we never can be.

Goodness—real goodness—was reserved for womanhood, and few men, even among the great men of the ages, have ever ascended the sublime heights. We need goodness in this world, but we must look to woman to supply it. The most that men can do is to furnish the energy and steam for material achievement, to build skyscrapers, and bridges, and railroads, and steamboats, and do the virile things of life. Yes, and to fight wars. If the regulation of the affairs of the world were left to the mothers, there would be no wars.

But I have lost my thread, and it seems fruitless to try to pick it up. Only it is a salutary lesson to learn one's limitations, and I have assuredly learned mine. I now know why I was never great, and why I never can hope to be. And that is something. It is something to learn a fact about yourself, and to have nerve enough to look that fact in the face and try to profit by it. And it would be well for all of us if we could hold ourselves at arm's length in front of us at times and actually see the kind of individual we are. Many of us might reform if we did this often enough, because most of us would be ashamed of the kind of individual we really are, and the kind the world knows us to be. Too much introspection may not be good for one, but too much is better than not enough. And the great achievement in life, after all, is just to be honest.

C. H. Johnson

Obituary



DR. EDMUND NOYES died at the ripe old age of 85, while visiting Dr. John Buckley in Hollywood, California. The late Dr. Noyes made a fine contribution to Dentistry, and was the father of Dean Noyes, of the Faculty of Dentistry, University of Illinois.

Oral Health

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Vol. 17

TORONTO, APRIL, 1927

No. 4

EDITORIAL

Membership Credentials and Dental Conventions



THE American Dental Association is co-operating with state dental associations in the registration of credentials at dental society meetings. Every member of the profession is to be required to present his credentials, and failing that will be obliged to pay a registration fee of ten dollars. This fee will be returned to the member's local society, and the latter will refund the amount, if, upon investigation, the member is found to be in good standing.

There have long existed most friendly relations between American and Canadian dental societies, each registering the members of the other as guests for the period of their visit. It is proposed that this cordial interchange continue, but that all dentists applying for registration at any convention should bear in mind that they will be required to pay the annual membership fee of their provincial society, unless they present credentials showing they are in good standing.

Canadian dentists are urged to arrange for their credentials before leaving home, that convention registration committees may be spared the trouble of collecting and forwarding fees to the members' provincial societies.

This plan is already in operation in so far as Ontario is concerned, and other provinces may make similar arrangements by communication with Dr. Otto U. King, 58 East Washington Street, Chicago.

The Trouble With Us All



REQUENT suicides among young people, and particularly college students, have led many grown-ups to enquire,—“What’s wrong with the rising generation?” The trouble with us all is the age-old clash of standards, old and new, or more technically, as some writer has said, there is a congestion at the moral cross roads, where youth and age so often meet and clash.

In a recent issue of *What the Colleges are Doing*, the editor referred to the responsibilities of the generations ahead, and said that “the elders too long have been framing up things in general on the suave assumption that ‘nothing succeeds like success,’ defining success in materialistic terms of economic significance chiefly, meaning that sort of success which is circumstanced so largely by things utterly beyond our control, and so generally without significance to those who deserve it most. To the observing multitude success has become largely a trick at which anyone may play. But this ‘keeping up with the Joneses’ is no comedy. It is very grim sport. To many it has become both philosophy and religion, this keeping up a modern front unmindful of the hungry spectres that still are sneaking in the rear.”

“To-day the test is the thing. What is your native I. Q., and what are you doing with it? Can you beat the curse that nature and your ancestral germ plasm are supposed to have put upon you? Or are you scared by the ghost? Your capital may be limited. What is your moral ‘turnover’? Your capital may be great. Are your gains equally so? Are you laying your plans to stay four years and see the business through, or are you just dodging until you are found out and fired?”

“Herein is the chemicalization that raises such a meaningless fizz in current discussion about the colleges. We are trying to enforce standards after the new style on our undergraduate contingent in general, to whom we so readily assume ourselves to be superior; and as diligently do we resist the possible bearing of these novel tests on our own too meagre stock of virtues. Up to the present we have ‘got by’ Dame Luck on the old-style examination. Why not let it go at that? But it is not the undergraduate alone who has got to meet the tests of this new day. The institution, the alumni (young and old), the trus-

tees (especially if they be plutocratic), the president (as always, it is part of his job), the faculty, and even the fond parent in the twilight background,—they all are to have their day in court, and they all squirm more or less under the ordeal, for the fact is, these are very squirmy times."

"Success of the old sort is comfortable. We all like its results well enough. But when we list the long line of worthies whom the world remembers most fondly, would the economic lure alone have put any single one of them over the top of the world's gratitude? We suspect not. The outstanding figure on the tablets of human memory to-day is that of the boy who did not succeed, the boy who got lost in the muck and mire of the fight, lost his identity, lost touch with his comrades, and who yet stayed on the job to the grim end,—the unknown soldier of the war. His memory humbles and ennobles the years. Is this the precious gift of the war? Is this the new spirit of youth? Then the old standards of success certainly must go; they are sadly out of date."

"We scan the moral landscape too rapidly these days. We cannot whiz through present-day follies at forty-five miles an hour and even see the more intimate beauties of the wayside. A slower pace would be a relief to all of us. Social pedestrianism should be revived. It is an art which breeds patience and tolerance, perspective and understanding. It is a dead-sure cure for the fly-by-night cynicism which so discolours current criticism of youth. 'We cannot build Utopias with young people corrupted at every turn by the example of their elders. We must start, so far as we can, with a clean slate.' (Will Durant, in *The Story of Philosophy*). And we must all start together. The test is on, and the test's the thing. Youth accepts the challenge. Why shouldn't the elders do the same?"

In Appreciation of Dr. W. J. Gies



R. WILLIAM JOHN GIES was born February 21, 1872, in Reisterstown, Baltimore County, Maryland. Shortly after the death of his father in 1874, he returned with his mother to her parent's home in Manheim, Pennsylvania, where he resided during his boyhood. Happily, his mother lived to enjoy the satisfaction derived from a knowledge of her son's achievements.

He was graduated from the Manheim High School in 1888. With such assistance as his mother offered and with the returns that accrue to the hustling American boy, he had earned and saved sufficient funds at the close of the summer of 1889 to encourage him to enter college. Putting the spirit of his thoughts and desires into action through thrift, energy and industry, he was graduated with honors from Gettysburg College in 1893, receiving the degree of Bachelor of Science. His activities at Gettysburg, however, were not confined solely to the

prescribed academic routine, for he was editor of the College Monthly and the Junior Annual, a member of the baseball team each year and its captain during his junior and senior years.

Imbued with the desire for added knowledge and learning, he was admitted to advanced standing at Yale in 1893 wherefrom he was graduated in 1894 with the degree of Bachelor of Philosophy, "working his way" by tutoring students. Inspired through his academic environment and activities he chose teaching as his vocation. The formative years of his education and training as a teacher were those he spent at Yale from 1894 to 1898, in close association with two noted scientists, for he was assistant in zoology to Verrill, 1894-95; assistant in physiological chemistry to Chittendon 1894-98; and instructor in physiology 1896-1898. Among his friends he often alluded in an affectionate and appreciative way to the noble influences of these master minds in moulding his career.

He received the degree of Master of Science from Gettysburg College in 1896 on the basis of his research and publications at Yale and in 1897 the degree of Doctor of Philosophy was conferred upon him by Yale after three years of teaching and research and special courses.

He was appointed to the medical teaching staff of Columbia University in 1898, where he has taught continuously to the present time, passing through the usual grades of promotion to the chair of full professor in 1905. At Columbia he founded the first department of biological chemistry in a medical school. He spent the summer months of 1899 at the University of Berne, Switzerland, as a special student in physiology and while there he completed two researches, one with Kronecker, the other with Asher, which were published soon afterward. The results of one of these he reported in person at the meeting of the British Association for the Advancement of Sciences held in Dover, England, in 1899, at which Lord Lister presided.

Active not only as a teacher, but a writer and investigator as well, since 1898 he has written nearly 400 papers, pamphlets, etc. During the period 1894-98 he was author of twelve research publications.

Dr. Gies suggested the organization of a dental department at Columbia University and was made a member of the organizing committee. He was secretary of the administrative board of the School of Dentistry of Columbia University from 1917 to 1921, which position he resigned in order to be detached in his studies of dental education in the United States and Canada. He founded the Journal of Dental Research in 1919 and has been an executive officer of the Board of Editors from the beginning; he founded the International Association for Dental Research in 1920, was its general secretary from 1920 to 1922 and honorary president since 1922. He was recently appointed a member of the Dental Advisory Board of the Department of Health of New York City and is now serving as chairman of this board.

Recognizing the extent and quality of the services of an untiring worker, Gettysburg College conferred upon him the degree of Doctor of Science in 1914; he was elected to Fellowship in the American College of Dentists in 1923, and Baylor University honored him with the degree of Doctor of Laws in 1924.

Dr. Gies was well and favourably known in dentistry long before the inception of the study and survey of dental education by the Carnegie Foundation for the Advancement of Teaching, chiefly through his work in dental research, his pioneer activities in the development of the Dental School of Columbia University and his attacks against trade journalism in dental literature and commercialism in dental education. He has, however, become more intimately associated with the dental profession since that time because of the effective, sympathetic and impartial manner in which he has conducted the study and survey of dental education. To-day, his name is to dentistry as Flexner's and Reed's are to medicine and law respectively.

He has endeared himself to the dental profession not solely because of the universal recognition of his ability as an educator, scientist and journalist, but also because of his great sacrifices and unselfish labours for the promotion of better health service through dentistry.

Correspondence

Prescott, Ont., Mar. 8, 1927.

Editor, *Oral Health*:

Dear Sir:—In the Feb. issue of *Oral Health*, I notice an article on "Taxing Teeth," in which you wonder why the teeth cost so much and why they were taxed.

About a year ago I read in the Philadelphia, Pa., "*Evening Bulletin*," where Mr. Riddle, during a heated debate on the tax imposed on his personal property, took out his denture so he could talk with more ease. A dentist member of the Tax Board noted their value and said, "That's a mighty nice plate you have." Mr. Riddle replied, "It ought to be, I paid \$2,000.00 for it, it's platinum." "Oh," said the dentist, "we'll just add that on your tax also." With the result that he was taxed thirty some dollars on the denture.

I don't know whether the "Personal Tax" is a State or Federal one, but it isn't a customs tax, as Mr. Riddell is an American citizen. Hope this throws more light on the subject.

Yours truly,

L. B. NUTTALL.

Winnipeg, April 12th, 1927.

To the Editor:

No argument is needed to convince one who is interested in the status of Canadian dentistry that the Canadian Dental Association as it has functioned in the past is in need of reorganization. Consequently it was with a feeling of real satisfaction that I learned that at the convention in Halifax it was definitely decided to draw up a new constitution for the Association.

To bring about this new order of things it was decided to have

delegates appointed from each province who should meet in committee, talk over our problems and draft the new constitution, which would be submitted to the various provincial organizations for ratification. At least this is the interpretation of the Halifax proceedings agreed upon by the executive committee. With this thought in mind the president, Dr. John Clay of Calgary, has called such a meeting for May 13th in the city of Toronto, and a number of the provinces have already appointed their delegates.

This being such a critical stage in the history of organized dentistry in Canada, suggestions as to the nature of the reorganization should be welcomed at this time.

To invest the business of the Association in a House of Delegates comprised of representatives from each province is admirable, but Dr. Conboy is to be commended for the firm stand taken, that these delegates should be appointed by the voluntary organizations in each Province and not by the Official Boards. This would give a much wider interest and a better representation; in fact to have it otherwise will spell disaster for the Canadian Dental Association.

These delegates should be allocated to the constituent societies based upon the enrolment of said societies. Part of the travelling expenses of delegates might be provided for out of the general treasury and the balance by the local societies. This phase should be discussed.

The committee would be well advised to pattern our constitution as far as is practical after that of the American Dental Association, which has worked out so successfully. This would mean a general membership, consisting of the members of the constituent societies. As much territory as possible should be organized. Every member should pay a certain fee into his local society, a part of which should go to the Canadian Dental Association. The fee should be large enough to meet the expenses of running the Association, allowing a salary or substantial honorarium to the Secretary, and include subscription to the Canadian Dental Association Journal. Membership should also include the privilege of attending conventions in other countries, or rather non-members should be excluded. For each member to pay personally into this Association will in itself create an interest otherwise impossible. If sufficient funds cannot be easily raised in this way then the provincial Boards might co-operate on a fifty cent per capita basis, as has already been suggested and which Manitoba has already agreed to, granting that there are no legal objections in any of the provinces and granting that such a donation does not make it necessary to admit unethical men to the Association.

It would further seem advisable to the writer that a convention be held annually in very close co-operation with some local convention, in such a way as to, in no way, interfere with local arrangements. By the mere presence of the delegates from other provinces, together with as many others as possible who might attend, there would be a stimulation of interest in the local meeting. Not to have a regular meeting of the Association presents many real difficulties.

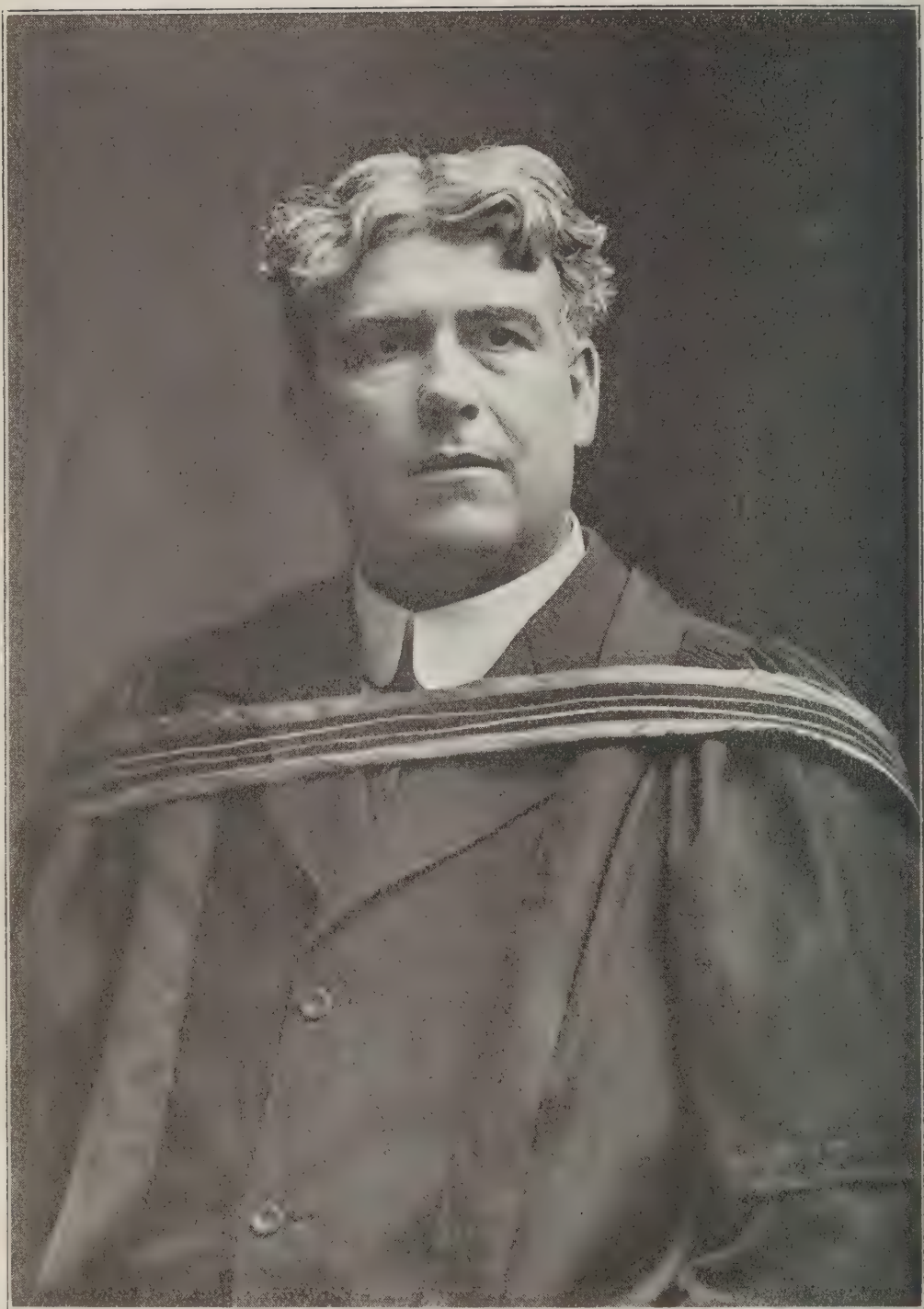
Canada is so arranged geographically, so divided as to interest, thought and language, that those of us who love our country wish to see it so harmoniously and efficiently organized as to make its impact felt upon world affairs. In so far as the profession of dentistry has a duty to perform in this connection, let us

"Attempt the end and never stand to doubt,
Nothing's so hard but search will find it out."

M. H. GARVIN.

Time

Time is but a mystic weaver
On whose loom our life's portrayed,
Deftly intermingling patterns,
Alternating light and shade;
Shot throughout with golden gleamings
Of the friendships we have made.

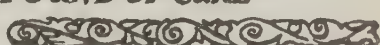


A. E. WEBSTER, D.D.S., M.D., F.A.C.D., TORONTO.

At the Annual Convention of the Ontario Dental Association held in Toronto, 16th to 19th May, 1927, Doctor Webster was unanimously elected President of the Association for the coming year.

ORAL HEALTH

*A JOURNAL THAT STANDS FOR THE OUNCE OF
PREVENTION AS WELL AS THE POUND OF CURE*



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The Cause and Treatment of Sensitive Dentin

NORMAN K. DOUGLAS, D.D.S., OWEN SOUND, ONT.

BY way of introduction to this subject, that it may be placed on an understandable basis, it is necessary to first consider the so-called "galvanic" or "voltaic" principles of metals and metallic salts. It is the object of this thesis to prove that sensitiveness of dentin is a manifestation of these principles, and that the natural method of overcoming this condition is to establish in the dentin a state of non-galvanic reaction.

Electric currents come from two sources,—frictional and chemical. The ancient Greeks rubbed amber on cloth to attract bits of paper, and our word "electricity" is derived from their "electron," meaning amber. This was the beginning of frictional electricity. It was near the end of the 18th century that Galvani accidentally caused a reflex action in the leg of a frog by contact with two metals; following his discovery, Volta invented the Voltaic Cell. This consisted of two different metallic plates suspended in an acid solution; wires were attached to the free ends, and when brought in contact a current was produced. Each metal has its "electric potential" based on its electrical difference from carbon. When used as poles in a voltaic cell, all metals produce strength of current or electro-motive force as great as the difference of their potentials. The same is true of acid salts immersed in a weaker acid solution than the one which is their base.

To apply this theory to teeth having sensitive cavities, we must first invert our picture. The sensitive vibrations travel towards the pulp, rather than from the pulp surface-ward, as some investigators would contend. The wires of contact are the substances in the tubules.

The metallic poles are the different metals and metallic salts which go to make up the composition of the dentin, and the acid bath is the lactic acid end-product of caries, together with acid content abundant in some salivas.

Before proceeding with more theory, it will be practical and advantageous to prove the truth of the foregoing statements. If we would

claim a similarity of principle between the sensitive cavity and the simple voltaic cell, it follows like tests should bear out our contention. Their behaviour must be the same, and herein lies the only practical method of control of sensitive dentin. To this end we will perform two experiments. Firstly the voltaic cell: in a container of sulphuric acid solution place two poles (for greatest difference in potential use carbon and zinc), connect them with wire leads to a volt meter. The meter will register over one volt. Now add a concentrated soda solution and the meter needle will return to zero as the acid content is neutralized. Mention is made here that the same result could have been obtained on the meter by breaking of the wire lead or removal of one of the poles from the acid.

Secondly, the sensitive cavity: the idea is the use of the same soda neutralizing agent on our cavity. For reasons of convenience, as well as being the most desirable as to sensitive conditions, labial and buccal cavities near the gingival margin have been selected. These cavities, on account of their sensitiveness, present the greatest difficulties in dental preparations and are most worthy of an attempt to alleviate the attending pain. Owing to the fact that the acid has to some extent permeated the dentin, and is also covered with a layer of leathery decay, we cannot introduce our soda solution as easily as was the case in our first experiment. For the success of our trial the following technique is recommended. First, as well as possible, dry the cavity to reduce the free acid to a minimum; a dehydrating agent should be used. This method alone will, to some degree, reduce the sensitive condition. Now press a saturated soda solution into the cavity walls. The best method to insure the introduction of the solution is the use of a pressure syringe through a rubber-washed surface which in circumference just fits the outer rim of the cavity. A test now shows the sensitiveness has been mastered, the sensations or electric impulses carried through the tubules have stopped and are no longer recorded in the brain centre which is the volt meter for the numerous voltaic cells. The conclusion is that the circuits of the voltaic cells set up in the carious sensitive cavity have been broken by the neutralization of the acid base by the soda alkali, as in the first experiment. A consideration now of the means of travel of the sensitive vibrations to the pulp, and thence to the brain, is in order; this is because of the difference of opinion as to the nature of the tubule content. Some authorities contend that the nerve fibres do not enter the tubules, but agree that the protoplasm content is identical with that of the pulp. This is all that is needed, and it is possible that all sensation travels through this medium rather than by any fibre or thread system. Electricity travels by means of a "Bump" system from molecule to molecule. Wireless telegraphy and radio have proved that all that is necessary is the continuous contact of the conducting molecules. Modern electricity makes use of the conducting and non-conducting principles of substances, and it is estimated that a good metallic medium, such as copper, con-

ducts electric currents one thousand, million, billion times as well as does shellac, which is classed as one of the best non-conductors. The most logical solution of the brain function is its comparison to an intricate storage battery, with its ability to record electric sensations as they happen and deposit them on the plate system for the future reference we know as memory. It is more than likely the body in its intricacy makes use of the conducting and non-conducting principles of its substances. While these last statements may seem to depart from the original theory, it is interesting to note in that they support the attempts made to control the general hyper-acid condition of the system.

There is still the consideration of frictional electricity. Perhaps the easier way to grasp this phase is to picture one of the simple type generators, where a core of alternating electric potentials revolves between two metallic brushes. Leads from these brushes carry an electric current. A rotating bur forms a good medium for the core, while the metallic deposits in the dentin act as brushes, and again the tubules carry the impulses inward. The solution of this minor electric trouble-maker is in perfecting a core evenly magnetic or, even better, non-conductive in nature; much good may be obtained by magnetizing the bur and, if possible, this sensitiveness may be eliminated with the use of some cutting substitute for steel which is non-conducting.

The author recommends that Ethyl Alcohol be substituted for soda, because it not only renders dentin a non-conductor but neutralizes and sterilizes the field of operation.—Editor.

Dental Musculation

WALLACE SECCOMBE, D.D.S.



ANY people adopt a superficial "chew-chew" attitude in mastication and may dutifully chew thirty-two times (once for each tooth) but fail entirely to normally exercise the jaws and teeth. The thing may be done in a lackadaisical fashion comparable to a worker "soldiering" on the job or a gymnast going through all of the motions without really exercising.

Dental musculation is the important thing—that is pressure upon the teeth by vigorous use of the muscles of mastication. Vigorous maxillary musculation should be practised during the meal hour and will result in improved dental health through a better supply of blood to the teeth and supporting tissues and a stimulation of salivary secretion.

Dentists are agreed that the changed dietary habits of people to-day and the refinement of foods have robbed the civilized races of even wear of the teeth and the opportunity for normal dental exercise through mastication. The deficiency may be supplied to a degree by massage of the gums or other artificial means. But just as walking and other natural forms of exercise are better than massage for the normal healthy

individual, so vigorous musculation is the natural way to raise the tone of the dental tissues and prevent diseased conditions that otherwise might ensue.

Mastication refers to the chewing of more or less fibrous foods, while musculation refers to the bringing of the jaws together with pressure gently sustained in a grinding motion.

This new application of this old word will add interest to a subject that may have become rather hackneyed. Musculation will bring about healthy function, and to this extent will act as a preventive of dental disease. It will also prove to be an important factor in maintaining balanced occlusion in the mouth.

Persons who cannot hold their natural teeth together with pressure and gently but firmly grind them without discomfort, should consult their dentist, that the condition may be corrected.

Prevention of Dental Disease*

E. W. FULLER, D.D.S., CHIEF DENTAL OFFICER, LONDON
PUBLIC SCHOOLS.

THE subject "The Prevention of Dental Disease," which the writer has been asked to present to you to-day, is more or less a new one. It is a vast subject of great importance and interest, and concerns the well-being of nearly all people who live in civilized countries. Considerable laboratory experimental work by different workers has been done in recent years; conclusions have been arrived at in some cases, but there are so few things concerning the subject that we are absolutely sure of, and so much to be learned that we have scarcely dreamed of, that it is with great humility I present this paper to you. The writer claims no originality for the ideas contained in the paper, nor is he in any way an authority on the subject, but rather one who, having had the opportunity of examining many thousands of mouths of school children and having observed the almost universal prevalence of dental disease among the children, has become intensely interested. Intentionally the matter to be presented is non-technical, containing little that the average dentist is not aware of, being directed more to those of you who are not dentists but yet interested in the present and future welfare of the children of this Province.

The writer wishes to convey to you an idea and picture which he believes to be correct and on which the whole subject of Preventive Dentistry hinges, namely:—normal, healthy individuals, living physiologically correctly, and possessing dental organs perfect in quality, number, form, and arrangement, are immune from dental disease. If we

* Read before the Health Section of the Ontario Educational Association, 1927 meeting.

get that idea and picture clearly in our minds, and then think of the almost universal prevalence of dental disease to-day among all civilized peoples, and then remember according to many reliable investigators, that uncivilized peoples living a natural or nearly natural life are almost immune, and that these immune people become very susceptible on changing their mode of living to resemble that to which we are accustomed, it would seem almost certain that our methods of living are at fault and that the secret of many of our troubles lies in learning how to live.

Up until recent years teeth have been considered as just teeth, as though they had no direct relation with other organs of the body, that they could become diseased or lost and it occasioned no cause for alarm as far as the rest of the body was concerned. Then it was learned that the condition of the teeth in health or disease could, and did, have, a real relation to the condition of health or disease of the body as a whole. When this idea was first brought forth, notably by that English physician, Dr. Hunter, it occasioned a great deal of wonderment and surprise that such could be the case, when really the surprise should have been that we had not recognized such a logical deduction long, long before. As time went by and the truth was broadcast that diseased conditions of the teeth and surrounding tissues were causing many degenerative diseases in other parts of the body, with which you are all now more or less familiar, a great cry went out for the Dental Profession to see to it that the mouths of the people were put in a healthy condition. That was fine recognition for the dentist, who, up to that time, had been looked upon more or less as a necessary mechanic for the repair of teeth or one who supplied artificial substitutes when the natural ones were lost; but in asking that of the Dental Profession, it was asking an almost impossible task, for while it was recognized that teeth might be causing trouble elsewhere, it was not recognized that it worked the other way also and that trouble elsewhere was causing diseases of the teeth. The sooner the members of the healing professions firmly grasp the idea that the body is a wonderful organic mechanism with all organs dependent on one another, and anything that affects or disturbs the normal function of one must to some extent, however small, affect every other organ, the sooner will we solve some of the problems for the prevention of disease.

Having examined many thousands of children's mouths and having noted the ravages of dental disease, the writer could by no stretch of the imagination conclude that dental disease was by any means a purely local disturbance, but has long since concluded in his own mind that it was a manifestation of a much graver disease than we have been accustomed to think of.

It would seem that we gain our knowledge by starting at the top and working down. We had universities before we had high schools, high schools before public schools, and public schools before kindergartens. It has been the same with dentistry. First it was the extraction of teeth

and the making of artificial substitutes, then the preservation of badly diseased teeth, then the attempt at prevention of teeth slightly diseased from becoming badly diseased, and now it is beginning to dawn upon us that perhaps we might be able to prevent teeth from becoming diseased. To-day we are at the height of that stage of trying to prevent slightly diseased teeth from becoming badly diseased, and it was principally with this idea in mind that School Dental Clinics were established. School Dental Clinics have filled a wonderful need, and have done, and will continue to do, a wonderful work and be the means of saving countless numbers of teeth that otherwise would be lost, but it will necessarily be by operative procedures, which is only preventive in one sense of the word. The other preventive phase of School Dentistry is in teaching the value of healthy mouths and in so doing make the minds of the children receptive, either now or later in life, to preventive measures, as we professional men learn them and pass them on for the good of mankind, that they will have learned how to live so that their offspring may enter this world healthier and when the dental organs appear they may be more nearly perfect in quality, number, form and arrangement.

A normal healthy individual, living physiologically correctly, is one whose habits of living are correct, and correct habits of living comprise eating correctly, sleeping correctly, and exercising correctly. All other factors such as elimination, sanitary conditions, surroundings, work and recreation, are only factors governing or being governed by the three habits mentioned. Of the three perhaps the most important and the one most abused is that of eating, and if we can learn how to eat, it would be comparatively easy to learn how to sleep and exercise.

Workers such as Howe, Mellanby, Wells, and others have demonstrated experimentally with animals fed on a diet deficient in vitamins, that diseases of the teeth and surrounding tissues take place practically as we know them in humans, while those treated in a similar manner, except being fed on a diet of natural foods containing the vitamins, remain healthy. It has also been demonstrated that those animals that develop disease recover when the diet is changed to natural foods. Also, it has been demonstrated according to Wells, that pregnant animals fed on a deficient diet give birth to offspring with teeth of poor quality.

Animals living in a natural state and consequently living on a natural diet appear to have healthy mouths, but animals such as our pet dogs, living on a diet such as we ourselves are accustomed to, frequently do develop dental troubles. It has been frequently pointed out that uncivilized peoples are much more immune to dental disease than highly civilized ones, and also that people living in countries where the standards of living are much lower than ours, and consequently their diet being much coarser and more natural, appear to be less susceptible to disease, but on bringing such people to this country, and on changing their diet to conform to ours, they seem to become as susceptible as we.

It might also be mentioned that scurvy is no longer the dread of sailors as it was in the days of sailing vessels and long voyages, since they have been able to secure and carry fresh foods. It is reported that during the Russo-Japanese War, the Japanese troops being fed on polished rice developed beriberi and on being fed the husks of the rice recovered.

In view of the foregoing, it would appear that the more nearly we keep to a natural diet and the less we doctor our foods, the less danger we run of disease. Believing to-day that such diseases as rickets and scurvy, which are perhaps much more prevalent than we have heretofore believed, are closely associated with deficiency in diet, we suspect, at least, that diseases of the teeth and surrounding tissues are possibly manifestations of the former.

As teeth are composed of inorganic salts, chiefly of lime and phosphorous suspended in an organic matrix, it necessarily follows that our diet should consist of foods containing a generous amount of those salts, if they are to be properly calcified and of good quality. If we stop to consider the highly refined and prepared foods we consume to-day, such as white flour, sugar, thoroughly cooked meats and vegetables, and think of the parts of the food we are casting aside, it is perfectly obvious that our diet lacks the necessary inorganic elements, for it is in the parts we throw away in order to have such refined foods that we find the inorganic salts and vitamins.

The question of diet includes that of elimination, for if the diet is correct and other habits are correct, elimination will take care of itself, for the bulk and roughage necessary for proper elimination will be in that diet.

As all the crowns of the temporary teeth and some of the permanent are formed at or before birth, it is obvious that the health of the mother and her habits of living must necessarily effect these teeth. If her diet is deficient in those materials which build teeth, necessarily the teeth will be deficient also, and nothing which can be done after birth can wholly make up for that deficiency. Likewise the early feeding of the child during the formation of the remainder of the permanent teeth will affect those teeth, and nothing that can be done later in life can entirely correct any deficiency which occurs during that period, so it is absolutely essential that the diet of the expectant mother and the young child should be correct in those materials that build teeth, or they will be lacking in quality. Deficiency in diet of the young child may so interfere with metabolism as to severely effect their structure and form as well.

It is known that there is only one really satisfactory food for the young infant, and that is mother's milk, which should always be the food where possible; any substitute will likely be lacking in some material.

We cannot pass on from this question of diet without making mention of the need of hard, coarse foods in order to induce proper chewing, bringing about the much-needed exercise of the teeth and jaws for

their proper development, for it is a thoroughly recognized principle that all organs of the body need plenty of exercise to bring about proper development, and to keep them in proper health. This is as true of the teeth as any other part of the body, and here again our accustomed diet of refined foods is greatly lacking.

The number of teeth in the vast majority of cases is correct, but Nature does, for some unknown reason, seem to make occasional mistakes; the writer attempts to offer no solution for those few cases where she fails to provide the necessary number.

In the matter of form, Nature again appears to make a few errors, but form of teeth is influenced to a large extent by the preceding question of diet and other influences during the period of formation. As previously stated, the lack of vitamins and sufficient inorganic salts in the diet affect the form and structure of the teeth,—they are not properly calcified, the points of union of the lobes of which the teeth are formed are imperfect, which often leaves deep fissures and pits, which after eruption become susceptible points for caries, as it is impossible for them to be cleansed either by the process of mastication or by artificial means.

The communicable children's diseases in the very young, especially up to three years, often interfere with metabolism, apparently in about the same manner as a deficient diet which produces a rachitic condition. If this interference takes place during the period of calcification, it is often manifested in the crowns of the teeth by deep notches, pits and crevices, and often by irregular thicknesses of enamel and even by its absence. These defects are susceptible points for the beginning of caries. The writer makes a plea for the attempt at control of these diseases on account of their effect on metabolism.

The number of influences affecting the arrangement of the teeth is large indeed, and it would seem that few mouths escape some of these influences, for very few mouths possess a dental apparatus perfect in arrangement. Any arrangement other than normal is more or less conducive to disease.

The bones of the jaws of the small child are very easily influenced by force and are affected by any pressure applied. Mention must be made of the pernicious habits of thumb and finger sucking, sucking of pacifiers, feeding bottles, lip and tongue sucking, lip biting, nail biting, etc. In the natural breast feeding of the child, Nature provided for just the right exercise needed to stimulate normal growth, and if artificial feeding is resorted to, the action of breast feeding should be copied as nearly as possible. The action of the habits mentioned, producing abnormal forces in the developing parts, often produces some very unfortunate and drastic results, so the discouragement of these habits should be the concern of all those interested.

The presence of adenoid tissue and enlarged tonsils is the cause of many mal-formed arches and abnormally arranged teeth, producing the high narrow arch, and consequent crowding of the teeth, as well as

producing a condition of mouth breathing, which continues to aggravate the abnormality. As this condition often develops very early in child life, and the damage is often caused before any attempt is made at correction, it would appear that the healing profession should make some effort to discover the cause and prevention of this disturbance in young childhood, for any attempt at correction of the damage can only be done later by extensive procedures such as orthodontic measures.

Lack of exercise due to lack of hard, coarse natural foods in the diet, as previously stated, causes faulty arrangement of the teeth, due to lack of development of the surrounding parts.

The early loss of teeth, particularly the deciduous, causes re-absorption of the alveolar tissue and lack of growth, producing a lessening in the size of the jaws. This early loss of teeth allows a drifting and tipping of the remaining teeth and in conjunction with the diminished size of the jaws produces an abnormal alignment.

For some years past, nearly every talk or printed article presented to the laity, due to the repeated loss of the six-year molar, occasioned to a large extent by the misbelief that it was a temporary tooth, contains reference to this very valuable tooth, calling it the most important tooth of the mouth and making pleas for its retention. To-day, due to this propaganda, nearly everybody has been made aware, to some extent at least, of the value of this tooth and that it really is a secondary tooth. The writer wishes to now make a plea for just as great propaganda for the retention of the deciduous teeth in a healthy condition, until the proper time for them to be lost, not for themselves alone, although this is important, but for their bearing on the oncoming secondary teeth, and to do so through the already gained knowledge by the laity of the six-year molar. The value of this tooth lies in its being in its proper position, otherwise it may not be any more important than any other tooth,—in fact it may be a detriment in the arch,—and its position is largely governed by the retention of the deciduous teeth in their proper places, so let us stress the need of it being in its proper position in conjunction with the need for its retention.

The too long retention of the deciduous teeth, though not nearly so common as too early loss, also causes irregularity of the positions of the secondary teeth, by not allowing the oncoming tooth to get into its proper place. The large number of these cases are caused by diseased conditions of the deciduous teeth, so that the natural re-absorption of the roots does not take place.

All these abnormalities are conducive to disease of the teeth and supporting tissues; the teeth do not touch one another in the arch in a proper manner,—due to the crowding they often come together with broad surfaces instead of as spheres. These broad surfaces coming together produce a stasis of saliva due to capillary attraction. This stasis in interfering with the free passage of saliva, which is really Nature's mouth wash, over the teeth is conducive to decay. The sup-

porting structures are thin and abnormal in form, and the forces of mastication are applied in an incorrect direction, causing trauma and consequently disease. To-day this is recognized as one of the chief factors in the cause of pyorrhœa (so called).

Artificial cleaning, stimulation and exercise can and should be produced by regular systematic and correct use of the tooth brush and dentifrice. Regarding the use of a dentifrice, it must be remembered that its first and primary object is to assist in cleaning the teeth; much more than that we cannot expect, and all the glowing and wonderful results that will be obtained from their use as set forth in their respective advertisements must be taken with a grain of salt. The tooth brush and dentifrice are necessary toilet articles of all self-respecting people these days, and the writer does not wish to detract from the good that can come from their use, but wishes to point out that intelligent and proper use of a tooth brush is something that requires considerable ability and skill in order to be of much use in the prevention of dental disease, and that its principal value is in supplying stimulation and exercise to the surrounding tissues of the teeth, which a natural correct diet would produce, but which is lacking with our diet of to-day. As far as the writer has been able to observe, there are very few children able to so use a tooth brush as to be of much use in the prevention of dental caries, and he cannot understand how they could be expected so to do. "A clean tooth never decays," has been a slogan that has been used for some time, and one the writer believes, but he does not believe a child is capable of cleaning the teeth thoroughly enough to make them clean, that is, clean so they will not decay, which really is perfection. This does not mean that children should not use a tooth brush; on the contrary they should be urged to do so, for it encourages clean, self-respecting hygienic habits, that are absolutely necessary for every child to learn, but we must look to other means for the prevention of dental caries in children, such as correct habits of living, with particular reference to diet.

Inlays of Cast Fusible Metal

T. C. TRIGGER, D.D.S., ST. THOMAS.



AS the ideal filling has never been found, the dentist has a choice of the different methods now in vogue and should not be confined to the use of any one of them alone. Since the cast filling has proved so satisfactory, the author has been using "cast fusible alloy inlays" and has met with a considerable degree of success, using them to take the place of large amalgam restorations in molars and bicuspid. Such fillings have been found to have a remarkable adaptability and a great preservative effect on tooth structure.

Owing to the softness of the alloy, the filling may be forced against the cavity wall with accuracy, and will thus hermetically seal the cavity and preclude moisture. The alloy possesses a tough property and is sufficiently hard to bear the stresses of mastication. The alloy contains principally tin, which has a decided germicidal value in preventing caries, as well as being easily polished into minute depressions along the margins. The technique for casting fusible alloy fillings is very similar to that for casting pure gold, but less heat, of course, is necessary in the process of melting and casting. If at the first attempt there is a failure to drive the metal through the sprue the case may be reheated and the casting pressure applied again. This alloy has remarkable fluidity, i.e., it is responsive to the slightest force and the component parts do not change their relationship in the mass during the process of casting. Care should be taken to allow the metal to cool thoroughly after casting.

This alloy can be used in casting bases in the construction of crowns. The cast base for a crown can be made by applying a small quantity of wax to the end of the crown and then forcing it to place against the root end. The surplus wax is then trimmed off. After the wax has been removed the crown is withdrawn from the dowel; the sprue wire is inserted on the free surface, so as not to affect those surfaces which come into contact with the crown and the root end.

An alloy made of tin, silver and gold in the proper proportions may be used successfully, not only in the construction of upper and lower plates, but also for casting inlays and crown bases as described above.

The means of retention for cast alloy fillings is similar to the methods used with inlays made of pure gold, including the hollow inlay and the shell inlay with various pin or post attachments.

Another use to which cast fusible alloy fillings may be applied is in crown and bridge work, especially when there has been extensive decay involving a large part of the tooth. Also, where pieces have been split off from the teeth, the fracture extending below the gum margin, inlay fillings can be made with great accuracy. Inlays are made for these cavities in the usual manner without contouring, but with slightly sloping sides. The fillings are cemented accurately into position and no difficulty is experienced in accurately fitting a telescope crown over teeth treated in this way.

Iridio-platinum wire or similar alloy should be used for post attachments, when making cast fusible alloy fillings, because pure gold or any other combination of metals will lose strength through the action of the casting process, as such metals become very brittle. The most convenient wire would be 18 or 20 gauge. No fluxes are required in casting low fusible alloy, as very little oxidation takes place.

It is to be understood that cast fusible alloy is recommended as an auxiliary filling and not in place of better materials when such can be used. (*Dental Items of Interest*, March, 1927).

Medical Director of Calydor Sanatorium Supports Government Grant to the Canadian Dental Hygiene Council

DOCTOR C. D. PARFITT, Medical Director, Calydor Sanatorium, wrote the following letter to the Deputy Minister of Health, Ottawa, in support of a Government grant to the Canadian Dental Hygiene Council. A grant of \$5,000 was included in the estimates and passed to augment a grant of \$2,500 previously granted to the Council by the Canadian Red Cross:

Gravenhurst, Ontario,
March 24th, 1927.

Dr. John Amyot,
Deputy Minister,
Department of Health,
Ottawa, Ontario.

Dear Doctor Amyot:

I learn from Colonel G. G. Nasmith that the Canadian Dental Hygiene Council is about to approach the Dominion Government with the hope of obtaining material assistance financially for their work. As a member of the executive of the Canadian Red Cross Society I was much interested in hearing of the scheme for development of dental hygiene as outlined by Colonel Nasmith at a recent executive meeting, and I was glad that the Red Cross Society voted a substantial grant to this work.

When this matter came up for discussion I told of some of my own experiences in regard to the need of dentistry in this locality. For a number of years Gravenhurst was without a dentist and there were no towns nearer than Bracebridge, 12 miles away, and Orillia, 25 miles away, where dentists were available. During the years 1910-1920, when for my own tuberculous patients in a sanatorium we were without dental assistance, I felt the need of such assistance very keenly, especially as it was during this decade that the importance of the teeth as sites of local infection became recognized. With the installation of efficient x-ray apparatus, the frequent need of extractions became even more impressed upon me, and lacking anything better I obtained a set of extracting instruments and learned something of the technique of extractions. For a short time I was assisted by a patient dentist. When it became known that I would undertake the occasional extraction of teeth, attempting painless dentistry, it was both pathetic and amusing the way in which patients from the country-side appealed for assistance. Most of the mouths presented were dreadful. Carious teeth beyond hope of repair, roots, and abscessed apices found by x-ray, often combined with severe pyorrhœa, were usual. For a time I was glad to offer

such relief as I could, and where occasionally I knew of severe arthritis existing and could suspect teeth as a possible factor, I arranged for such cases to be brought to me. My recollection is that one marked case of this kind had twenty-three teeth extracted, but the arthritis had been too long continued to obtain material relief. This man also had several abscesses and his gums were troughs of pus. Fortunately two dentists became established in the neighbourhood and my experience was brief. I can, however, think that the condition with which I was familiar here a few years ago must be widespread in Canada, since there are many localities where dentistry is not easily available and since even many fairly intelligent and economically well-placed individuals in the country have no proper appreciation of dental hygiene.

Quite apart from the question of clean mouths and well-cared-for teeth being æsthetically desirable and necessary for good digestion, I am convinced that focal infections at the apices of the teeth are responsible for many illnesses. The depraved health resulting therefrom is, I feel sure, a real factor in weakening general resistance so that tuberculosis may develop as a result. The relation of diseased teeth to heart disease, arthritis, and anæmia is widely recognized by the medical profession, but I do not think it is recognized generally that these latent focal infections favour the development of tuberculosis.

Both on general grounds and as an aid to the anti-tuberculosis campaign, I was very glad to learn of the efforts of the Canadian Dental Hygiene Council, and I believe this campaign for the spreading of information about the need of good teeth and furthering the means of making their teaching effective is worthy of generous support by the Dominion Government, and I trust the Dominion Government may see fit to make a generous grant to the Canadian Dental Hygiene Council.

With kind regards,

Yours faithfully,
(Sgd.) C. D. PARFITT.

Doctor J. Menzies Campbell Honoured



THE many friends in Canada of Dr. J. Menzies Campbell, who has been practising dentistry in Glasgow for many years, will be glad to learn of his having been elected a Fellow of the Royal Society of Medicine and a member of the section of Odontology.

Focal Infection and Its Relationship to Systemic Disease, With Reference to Tuberculosis

WILLARD F. ARMSTRONG, D.D.S., TORONTO.

BEFORE presenting this paper, let me express to you my appreciation of the honour and privilege I feel it is to appear before you; in order that we may have, it is to be hoped, a better understanding of the subject to be presented.

Let us spend a short period in discussing the relationship of Dentistry to Medicine. In former years, it will be noted, physicians and surgeons paid little or no attention to mouth conditions; and, sad to relate, the dentist restricted his field of labour to the filling, removing and replacing of teeth, with little respect to the general systemic condition of the patient. The physician looked upon the dentist, and partly correctly, as a mechanic; while the physician did not refer his patients to be examined by a dentist, for a report on the oral conditions present.

Times and customs have changed with the passing of the years. We now consider that Dentistry is a highly specialized branch of Medicine; that to be efficient we must take into consideration, the general health of the patient, besides the oral conditions as found, before forming a diagnosis; which leads the dental surgeon to consult with the physician.

Without the aid of dental consultations, medical men would often be seriously hampered, not only in the recognition of the nature and origin of certain ailments, but also in the adequate handling of them; and in turn dental practitioners deprived of the aid of medical consultants would, in at least many instances, fail of success in the management of local or oral conditions, that are known to be markedly influenced by pathological states elsewhere in the body.

The co-operation of which we are speaking is now generally carried out, and especially between the younger men of the professions. This co-operation is especially needed in hospitals. In our own City, we have the Toronto Western Hospital, which embodies this ideal condition, to a greater extent than any other hospital in Canada. This hospital yearly appoints a Dental House Surgeon. One of his duties is to examine all public ward patients, immediately after, or in conjunction with, the medical examination. A full report of the oral conditions, diagnosis and treatment suggested, is made out, also a short talk on oral hygiene is given, and instruction in the use of the tooth brush. This, I believe, is the only hospital which sees that every public ward patient is supplied with a tooth brush.

Coming to our subject of the Relationship of Focal Infection to Systemic Disease, we find a vast field to cover. I will not burden you by attempting to discuss in detail the many phases of this subject, but

will merely define, enumerate, and give a few examples of the diseases which arise from focal infection.

A focus of infection may be defined as a circumscribed area of tissue infected with pathogenic micro-organisms, (or, in other words, disease-producing bacteria).

We may have primary or secondary foci. *Primary foci* usually are located in tissues communicating with a mucous or subcutaneous surface, such as teeth, tonsils, nose passages, etc. *Secondary foci* are the direct results of infection from other foci, through contiguous tissues, or at a distance, through the blood stream or through the lymph channels.

Focal infections which are responsible for numerous surgical conditions, may be found to exist in the sinuses, mouth, etc.

As far back as 1859, Chassaing claimed that putrid conditions of the gums were responsible for such general diseases as even sepsis. Among the conditions representing foci of infection in the month, may be mentioned: pyorrhœa alveolaris, decay of the teeth, diseases of the pulp, exposure of bones between the teeth, abscess about the apex or tip of the root of a tooth, apical granuloma, and accumulations of foul matter about the teeth.

Time and again the above-mentioned conditions have been found to be the cause of such conditions as empyema, cholecystitis, arthritis, brain abscesses, liver abscesses, etc. Haden and Bohan, in a recent review, conclude that peptic ulcer, or ulcer of the stomach, is of infectious origin, also that gastro-duodenal malfunction, that is, stomach and intestinal disorder, is likewise of focal origin. Their conclusions were drawn from experimental proof (on rabbits) of a causal relationship of chronic foci of infection to an existing peptic ulcer, or stomach ulcer; this evidence was obtained by injection into the rabbits of bacteria recovered from the focus of infection, namely, the teeth and tonsils. That is to say, a patient suffering from ulcer of the stomach, who had infected teeth and tonsils, upon removing bacteria from these teeth and tonsils, and injecting them into healthy rabbits, produced in those rabbits ulcer of the stomach.

Latest reports of Fink describe a case of suppurative posterior ethmoiditis and sphenoiditis with complete destruction of the optic nerve. In other words, a case of pus oozing out of the ethmoid and sphenoid bones, was completely eliminated after removal of the foci of infection; also, bacteria from the foci, injected into rabbits, produced the same condition in the rabbits.

I do not want to be misunderstood, in regard to foci of infection being confined to the mouth. Oral sepsis or oral infection is merely one small chapter, though undoubtedly a very important one, of the treatise that deals with the subject of focal infection in general.

I emphasize this point, for too often patients, and sometimes dentists and physicians, think of focal infection as being practically identical with oral sepsis, forgetting, or not knowing of, the other important areas, such as the naso-pharynx, the para-nasal sinuses, the middle ear,

the respiratory tract, the digestive tract and its appendages, and the urogenital tract, any one of which may be the site of a focus of infection, whence other parts of the body may be deleteriously influenced.

Among the pathological conditions in the human body that are often secondary to focal infections may be mentioned: arthritis; diabetes; rheumatic fever; (in children) myositis, neuritis, endocarditis, nephritis, iritis, anæmia, neuralgias, chorea (or St. Vitus Dance), and certain general run down states of the system.

To this latter state let me refer for a few moments:

(A)—A little girl, aged 13, whose chief complaint was lassitude and loss of weight, was admitted to the Hospital. Her past history was that of a normal, healthy child, able to do as other children; at school she stood about mid-way in her class. During the winter of 1925 she began to lose her appetite, did not sleep well, did not have very much energy, seemed tired all the time, could not study, so stopped school. She was losing weight rapidly.

On being admitted to the hospital, she appeared as a poorly developed, much emaciated young girl, very pale and anæmic looking. During the last six months, April to September, 1925, she had lost 60 pounds. Her past history was negative to her present condition.

Several specialists were consulted, but no definite diagnosis was made. She did not respond to any form of treatment. The child became weaker, would not eat, and could not sleep; her condition seemed hopeless, two weeks being given for her to live. As a last resort, she was referred to the Dental Department for examination. A lower molar with large cyst was extracted.

Two weeks after extraction the child had gained 11 pounds. At time of extraction she weighed 58 pounds, one month later she weighed 81 pounds, was sleeping and eating well; colour had returned to her cheeks, and she was running around again as other children do.

From this case we note an excellent example of a general run down condition, due entirely to a focus of infection.

I may say that this case, being a private patient, did not come under the dental routine examination of the Hospital. Private cases are only examined upon the request of the attending physician.

In Case "B"—we have a patient 45 years of age, admitted to Hospital per stretcher. Condition poor, very much amaciated, anæmic and neurotic. Chief complaint weakness, becoming progressively weaker each day.

Medical diagnosis—diabetes mellitus.

Oral examination presented a very marked case of oral sepsis, with a general pyorrhœa condition, marked looseness of teeth and pus around gums. Treatment—extracted one tooth at a time; patient had severe reactions. Finally all foci in the mouth were removed. When patient was discharged from hospital his condition was much improved. He

was able to walk briskly, had put on weight, colour returning to his cheeks, and his insulin dosage was being diminished.

In this case we have a diabetic with marked oral sepsis, which lowered his resistance.

What I want to emphasize in this case, is the fact that while we do not for one moment assume that the foci of infection in the teeth was the cause of the diabetic condition, or that the removal of the same was the cause of clearing up the condition, what we do feel is that these foci were contributory to his condition, and that removal of these, in conjunction with the medical treatment, hastened recovery.

Case "C"—Patient 33 years of age—presented with an enlarged heart, pulse rate being very rapid, 144 per minute. Oral condition poor, all teeth badly broken down with decay. After consultation with his physician, one tooth was extracted on March 5th, 1927. One week later pulse rate was 132 to the minute—3 teeth were extracted. On March 19th, pulse rate was 120 per minute—4 more teeth were extracted. On March 26th, patient presented with a pulse rate of 108 per minute, pulse fairly steady and more definite. In 3 weeks, it will be noted, pulse had dropped 36 beats to the minute.

Let me now quote a recent report from the Mayo Clinic.

"In one hundred cases of chronic ulcerative colitis reported, the elimination of foci of infection, aided by autogenous vaccines, played the important part in the treatment.

Fifty of the one hundred patients returned home, practically cured; thirty showed marked improvement; eighteen did not improve, and 2 died.

Forty-six patients had pulpless teeth, some x-rayed positive and some negative. Twenty per cent. of these patients improved definitely directly after dental operation, and before other treatment was instituted."

These results emphasize the important part dental foci of infection play in such a serious disease as chronic ulcerative colitis, especially by contrast with the results in past years, when these patients returned to their homes with little or no hope of improvement.

Now in discussing dental infections and tuberculosis, let me give you a brief outline of the disease known as tuberculosis of the lungs, so that we may refresh our minds as to the meaning and course of this disease, the medical term for tuberculosis of the lung being *phthisis pulmonalis*. *Phthisis* is a Greek word, which means "I waste."

Tuberculosis may be defined as a specific infectious disease, produced by the action of the bacillus tuberculosis, characterized by the formation of tubercles, which tend to undergo degenerative changes in the direction of softening or of calcification.

This disease attacks not only the feeble physical development of some, but also the athletic; town dwellers suffer more often than those who are privileged to live in the country.

Unsanitary occupations, exposure to dust, and confinement in close rooms, are all predisposing factors to this disease.

Females are more liable than males; no age is exempt, but it is found less common in the old. Tuberculosis of the lung is a disease chiefly of adolescence and adult life. Children more often suffer from tuberculosis of the bones, glands, etc.

We may become infected by:

- (1) Inoculation of tuberculous material, from wounds, etc., or by
- (2) Inhalation of dried and powdered sputum, dust of apartment rooms, crowded dwellings, ill ventilated dwellings and sedentary occupations; or by
- (3) Ingestion of tuberculous material by swallowing the sputum, or by swallowing infected meat or milk.

Once infected with the tubercle, it may spread within the body,—

- (1) Along the mucous membranes of the pharynx, eustachian tube, middle ear meninges, etc., or
- (2) It may spread through the lymphatics, or in the blood stream.

All these demand a local infection, or a focus of infection, for a starting point.

Now with this general survey of tuberculosis, let me quote from Crookshank, in his study of the influence of oral sepsis in the production of this disease. He states that "even though it cannot be said that oral sepsis actually paves the way for infection by the bacillus tuberculosis, it cannot be denied that fatal tuberculosis of the lungs is frequently the result of a mixed infection, in which the streptococci (one of the most dangerous types of organisms from the mouth) are accomplices; while pulmonary streptothricosis seems to be definitely a gum infection at first."

According to Price, it seems probable that one of the most important portals of entry for the tubercular infection is through the cavities of dental caries of the teeth. From the dental caries, the tubercle bacilli penetrate the exposed and infected pulp chamber, and from this gateway proceed through the lymphatics to the deep and cervical lymph glands of the neck.

In the opinion of Price, individuals with a marked susceptibility to periodontoclasia give a large percentage of individuals developing tuberculosis.

In studying cases of tuberculosis at the Tubercular Sanatorium at Cleveland City Farm, Price was told by the Dental Surgeon in charge that predisposition to gingival infections and alveolar recessions constituted the characteristic lesions associated with tuberculosis.

Now the prevention of focal infection is a most important principle in the consideration of the treatment of the causative factor and the related systemic infections.

We cannot wholly prevent or abolish these factors, such as marriage of the mentally and physically unfit, vice, alcoholic and drug

addictions, poverty, unhealthy environment, and the use of contaminated food and milk; but the control of these debility producing factors is a function of the national, provincial and municipal public health bodies.

Applying the well known axiom in the treatment of disease, namely "remove the cause, if possible," to disease due to focal infection, we have the remedy.

And now for a few remarks directed especially to you, who come in contact with the child. Our review of focal infection would be of little consequence if we did not attempt to localize and apply our knowledge, in order that mankind might be helped on the road to health.

The maintaining of health may be done in three ways:

Firstly—Detection of infection in its early stage.

Secondly—The maintaining of oral hygiene, and

Thirdly—By education.

These are days of preventive medicine and preventive dentistry. It falls to the lot of the school dentist and nurse to detect many of these aforesaid lesions in the mouths of the young, while they are in a localized acute condition and before secondary infections may be established.

Having detected these lesions, it becomes the duty of those responsible to see that these septic areas are cleaned up, thus attaining a state of oral cleanliness.

Having attained this mouth health, we must endeavour to maintain this state. This can only be done by education. May we ask the question:

"What do we mean by dental education?"

By such things as tooth brush drill, which takes care of the child at home; by dental health talks, which takes care of the child at school; and by regular periodical examination by a dentist.

By laying this foundation during the early period of the child's life, in a large percentage of cases, these principles of oral health will be adhered to, up to and during adult life.

We may all agree with the view expressed by Disraeli, when he said that public health was "the foundation upon which rests the happiness of the people and the welfare of the State."

I will close by quoting, or misquoting, the old saying, which says: "Ignorance may be bliss"; but there is perhaps no pain or grief like that expressed in the following lines:

"Of all sad words of tongue or pen,
The saddest are these:
It might have been."

The Conquest of Sepsis—A Tribute to Lister*

BY SIR JOHN BLAND-SUTTON, BART.

Late President of the Royal College of Surgeons of England.



CENTENARIES remind us of our predecessors and reawaken our memories to the benefits we derive from their discoveries. The discovery of the anæsthetic properties of ether and chloroform 80 years ago is a landmark in the history of surgery; and it is common knowledge that 20 years later surgical operations increased enormously in number in all big cities, and postoperative sepsis became so common and so mortal as to threaten the extinction of operative surgery as an art. Endeavours to ascertain the cause of sepsis exercised the minds of the greatest surgeons.

The principles underlying the treatment of wounds were based on the idea that festering was due to something which entered wounds, and the time-honoured methods adopted in treatment consisted in removing any foreign body that might be in the wound; to staunch the bleeding, usually with the aid of styptics, then close the wound and allow it to heal. The styptic might contain something to stimulate the healing process. This method of treating wounds can be traced back 3,000 years; it was practised by famous physicians in the Trojan war.

All who are acquainted with Virgil's *Æneid* can recall this stirring story: When the hero *Æneas* was wounded in the thigh with a dart, the celebrated Trojan physician *Iapyx* came to aid him. After some trouble the head of the dart was extracted and *Iapyx* instilled into the wound a tincture to which the goddess *Venus* added, unknown to the physician, some juice prepared from the stalk, leaves, and flowers of dittany from Crete. Suddenly all pain fled from the wound, and all the blood in the deep wound was staunched. *Æneas* soon recovered his vigour and, urged by *Iapyx*, returned with zest to the fight.

In 1866 a patient was admitted into the Glasgow Royal Infirmary with a compound fracture of the leg and had the good luck to come under the care of Joseph Lister, the professor of surgery, who treated the fracture on the same principles as *Iapyx* treated *Æneas*, but instead of a tincture containing dittany he instilled into the wound a solution of crude carbolic acid. There was nothing poetical in this, but the result exceeded Lister's expectation for the patient recovered with a useful limb. The usual treatment at that time was amputation, and even in such an event the patient usually died from sepsis. The successful issue in this case was of the utmost importance for it laid the foundation of the glorious edifice of Antiseptic Surgery.

The treatment adopted by Lister in this instance was no sudden

* Tuesday, 5th April, 1927, was celebrated throughout the world, as the Centenary of Lord Lister's Birth. [Editor.]

inspiration. When he served as Syme's assistant surgeon in Edinburgh in 1856, postoperative sepsis was endemic in every infirmary and hospital in the British Isles. Lister attributed sepsis to something which entered wounds. He believed that putrefaction was caused by the oxygen of the air; chemists believed this. Lister thought that sepsis could be communicated to wounds by instruments, sponges, and the fingers of surgeons and attendants. He devised means for preventing infection and selected carbolic acid, at that date called creosote, a chemical novelty used for deodorising sewage, for the purpose of destroying the agents of sepsis, and he adopted the word Antisepsis for his method. Whilst Lister was busy with these investigations Cohn made the important discovery that yeast was a microscopic plant. Pasteur discovered that fermentation and putrefaction were due to the action of microbes. Lister welcomed Pasteur's demonstration "that putrefaction like other true fermentations is caused by microbes growing in the putrescible substance." These brilliant discoveries proved that the apparently dissimilar processes—fermentation, putrefaction, supuration and sepsis—are due to the action of minute living organisms.

Pasteur's discovery revolutionised the methods of the winepress, brewery, dairy, and sewage farm; Lister's transformed the methods of operative surgery, and they are by no means limited to mere wound treatment; they have led to extraordinary changes in surgeries, hospitals, and lying-in chambers. All great changes introduced into an ancient craft stir up opposition and ridicule. Some cautious surgeons who laughed at antisepsis endeavoured to follow the method. Others who jibed went slowly, but surely, to the wall.

In the face of opposition Lister pursued his course apparently unruffled. The younger surgeons—enthusiastic converts—adopted his principles and gradually introduced the methods of the bacteriological laboratory, sterilisation by heat. This ultimately became the Cult of Asepsis. Indeed, heat is the most perfect antiseptic known. Odoriferous carbolic acid persists as a memory!

Since 1900 operative surgery has advanced with such strides that text-books of surgery have become, like railway time-tables, useful only for a season. Surgical methods change monthly. Operating theatres which resembled shambles in 1860 are replaced by rooms of spotless purity containing scintillating metal furniture and ingenious electric lights. All concerned in the operation are clothed from nose-tip to toe-tip in sterilized linen garments, and their hands covered with sterilised rubber gloves. The patient is in a sleep as deep as that of Adam in Eden; and the theatrical silence is only broken by the rhythmical breathing of the patient or an occasional utterance from a nervous operator. Modern surgery is wonderful. I was trained in the old school and lived to revel in the wonders of the new. But this is not the end; the legitimate function of surgery is the repair of physical injuries. We must strive to cure morbid growths with drugs prepared

by biochemists. We may believe that chemotherapy* and physics, which have furnished surgeons with powerful and reliable remedies, will help to deliver mankind from some of the most distressing and unpromising operations of modern surgery.

There are clear signs of the dawn of such an era. The dominating features of Lister's life were his persistent enthusiasm and faith for the cause he had at heart; and his courage in the face of the incredulity of contemporary surgeons is beyond all praise. The propagation of a New Gospel in religion, science, or art demands forceful disciples. If Lister had had an apostle with the zeal of Saul of Tarsus, or a disciple with the eloquence of Huxley, the Listerian principles of wound treatment would have been universally accepted before 1900. In spite of this, Lord Lister had the rare privilege of living to see his principles adopted by surgeons throughout the world.

The bronze figure of Lord Lister in Kelvingrove Park exemplifies his steadfastness in the pursuit of Truth; the granite block which supports it is typical of the firm foundation on which his discovery rests. The monument is an expressive tribute to the great surgeon, whose influence will remain as long as surgery is practised as an art, and the conquest of sepsis will continue to be a blessing on every race of mankind.—*Lancet*.

Somnoform Anaesthesia*

F. W. E. WAGNER, M.A.



HAVE set myself the task of bringing under your notice in some detail to-night a most valuable general anæsthetic which, for some reason or other, has never been at all popular in this country. I am not suggesting that Somnoform is a purely dental anæsthetic. It is extremely valuable in ordinary medical practice, especially in those minor surgical operations which a doctor does not exactly like to send to hospital, and which cannot well be operated on otherwise, because of movements of the patient from pain or nervousness, such as the opening of superficial abscesses, tenotomies, aural and nasal polypi, removal of tonsils and post-nasal adenoids, passive movements of stiff muscles and joints, evulsion of toe or finger nail, curettage, reducing dislocations, etc.

Somnoform is specially valuable in operations on the upper air tract, because no asphyxia is developed, no feeling of suffocation, and no cyanosis.

Somnoform was introduced by Dr. Rolland, Dean of the Dental School at Bordeaux. The original formula was:—

* A paper read in Trinity College, Dublin, before the Dublin University Biological Association, on November 18, 1926, and published by courtesy of "Oral Topics."

Ethyl Chloride	60 per cent.
Methyl Chloride	35 per cent.
Ethyl Bromide	5 per cent.

This formula was found to be unsatisfactory. The pharmacology and pharmaceutics of the drug were investigated and revised. Various changes were made, and different formulæ were tested, until the formula now in use was reached. The present formula is:—

Ethyl Chloride	83 per cent.
Methyl Chloride	16 per cent.
Ethyl Bromide	1 per cent.

The small percentage of ethyl bromide was retained for its valuable sedative and analgesic effects.

Somnoform is a very volatile anæsthetic, and when confined in the glass ampoules in which it is sold is a transparent fluid, but when the

The unpopularity of Somnoform is an instance of giving a dog a bad name. The reputation of the original and unsatisfactory formula hung like a cloud over the name Somnoform, and if the revised and satisfactory formula had been presented under a totally different name it would probably have become a popular anaesthetic.

ampoule is broken in the inhaler the fluid becomes a volatile gas. It is administered by the Stratford-Cookson inhaler which consists of a metal facepiece having an inflatable rubber margin, a metal framework of two cylinders joined at the base, and a rubber bag of the usual type. A single lever actuates metal valves so that the anæsthetist can regulate the proportions of air and Somnoform as he desires.

In looking over the writings of various eminent specialists in anæsthesia, I have been struck by the hostility which most of them display towards Somnoform. Perhaps this explains the fact that it has never had a fair trial in this country. One eminent dental surgeon told me that he had never used Somnoform, adding, "I don't know why; probably because of things I read about it." But this hostile attitude of the authorities is not really so serious, because most of them quote the original formula (which was admittedly unsatisfactory, and which is now unobtainable) instead of the revised and satisfactory formula. The unpopularity of Somnoform is an instance of giving a dog a bad name. The reputation of the original and unsatisfactory formula hung like a cloud over the name Somnoform, and if the revised and satis-

factory formula had been presented under a totally different name it would probably have become a popular anæsthetic.

Even Hewitt gives the original formula, and the remarks about Somnoform in the 1924 edition of his book are unaltered from those in the 1912 edition.

UNFOUNDED OPINIONS.

Dr. J. Mavrocordato, writing some time ago in *The International Journal of Orthodontia*, says: "Ethyl Chloride . . . being to-day recognized as safer, and with less after-effects, than Somnoform." And then he quotes the original formula.

So eminent an anæsthetist as Dr. Dudley Buxton says: "Such combinations as . . . Somnoform . . . need merely to be mentioned as extremely unsatisfactory agents." (Index of Prognosis. Article on Anæsthetics.)

And H. E. Boyle, in his book, "Practical Anæsthetics," refers to Somnoform as follows: "The anæsthetic Somnoform may be dismissed with a few words. It was introduced as a rival to ethyl chloride, which is its chief constituent. The administration and effects produced are alike in the two cases, but Somnoform is apt to decompose, and then it becomes highly poisonous."

It is difficult to resist the inference that most text-book references are simply copied from book to book, with no personal knowledge of the drug, and without any verification of the statements.

BASED ON INCORRECT FORMULA.

In answering these objections we may, of course, entirely disregard those which are based on an incorrect formula. One wonders on what experience of Somnoform Dr. Buxton bases his view that it is to be classed among "extremely unsatisfactory agents." Over some hundreds of administrations I have found it uniformly satisfactory. As to Dr. Boyle; every sentence of his comments which I quoted a moment ago is most misleading. Somnoform was not introduced as a rival to ethyl chloride. The administration and effects are not by any means alike. Somnoform anæsthesia is not ethyl chloride anæsthesia, as any man who has had experience of both is perfectly well aware. Is Somnoform "apt to decompose"? With so volatile a drug I should think that exact quantitative and qualitative gas analyses would be necessary in order to determine with certainty whether it is stable or not. As a matter of fact, samples of Somnoform two years old, which had come through the Tropics, have been used without any untoward effects.

THE EVOLUTIONARY STAGES.

It should be remembered that every anæsthetic has to pass through the same evolutionary stages: imperfect preparation of the drug, imperfect apparatus for administering it, and imperfect knowledge of its

pharmacology. Somnoform has passed through these stages; and it is obviously misleading to attribute to it to-day the faults which marked those early stages. It is a matter of history that the early administrations of ether were attended with difficulty and uncertainty; but we do not, for that reason, say that ether is an unsatisfactory or an uncertain anæsthetic. Thousands of the early administrations of Somnoform were done with most unsuitable inhalers, and the ability of the anæsthetists ranged from absolute ignorance to the greatest skill. Yet only four deaths have been recorded. One was due to fatty degeneration of the heart, another to shock following the amputation of both legs; while the other two seem to have been deaths under the anæsthetic rather than deaths due to the anæsthetic. No other anæsthetic in general use ever had so few deaths attributed to it as Somnoform. In 1,500,000 administrations in America only two authentic fatalities have been recorded. In 25,000 administrations at Bordeaux, Dr. Rolland did not observe a single alarming symptom. In the Melbourne Dental Hospital it has been the routine drug in general anæsthetic work for many years. It is the only general anæsthetic used in the dental service in the Toronto schools. The literature of Somnoform is remarkably free from information as to what to do in case of accidents, because the history of Somnoform itself is remarkably free from accidents.

THE ACTION OF SOMNOFORM.

Now, let us turn our attention to the action of Somnoform. I hope that I have said enough to show that its claims, at least, merit consideration. Seeing that ethyl chloride is itself a general anæsthetic in fairly common use, it may be asked what is the point in adding the other two drugs? The first and most important answer is clinical. Its meaning is best obtained by contrasting the action of ethyl chloride used alone with the action of Somnoform. Anæsthesia from Somnoform is usually absolute in from 30 to 40 seconds, and is marked by little or no excitement. Nervous patients usually become tranquil as anæsthesia progresses, and awake calm and peaceful as from natural sleep. Anæsthesia is marked by complete muscular relaxation. Nausea occurs about once in a hundred cases, and even then it is very slight. Headache hardly ever occurs. Now with ethyl chloride the period of induction is longer; the masseter muscle, which greatly influences the closure of the jaws, is rarely fully relaxed, and often takes part in the spasm which is common to the muscles of the extremities. Headache following is quite common, while nausea is so common as to constitute a serious drawback.

THE EFFECTS OF METHYL CHLORIDE AND ETHYL BROMIDE.

The second answer is theoretical, and explains, to some extent, the clinical results. By its diffusibility the methyl chloride secures promptness of action, the ethyl chloride prolongs the anæsthesia, and the bro-

mide produces a stage of analgesia immediately following the anæsthesia, and of nearly equal value for light operating. In other words, the methyl chloride induces anæsthesia quicker, and the ethyl bromide practically doubles its length. And further, the mixture seems to give the valuable properties of each of its constituents, while greatly decreasing their dangerous properties.

When these facts are carefully considered, it is evident that the addition of methyl chloride and ethyl bromide confers benefits which no anæsthetist can afford to ignore. The addition of these drugs to ethyl chloride make Somnoform.

BENEFIT FROM WARMTH.

It is well known that ether and nitrous oxide both work much more smoothly when the vapour is warmed, and the same is true of Somnoform. It is good practice to place the metal container of the Stratford-Cookson inhaler in hot water for a few minutes before using it. The manufacturers are at present making for me an inhaler which is fitted with a water-jacket somewhat on the lines of the familiar Clover's inhaler.

It is evident that the addition of methyl chloride and ethyl bromide confers benefits which no anaesthetist can afford to ignore. The addition of these drugs to ethyl chloride makes Somnoform.

Somnoform is obtainable in sealed glass ampoules of 5 c.c. and 3 c.c. As a general rule, 5 c.c. is sufficient for normal cases. The best plan is to put an ampoule in the inhaler, break it, remove the empty and replace with a full one. This can be broken at any time during the administration if a further supply of the anæsthetic is required.

POSITION FOR DENTAL OPERATIONS.

For a dental operation the chair is adjusted so that the patient is sitting almost upright, with the head erect on the shoulders. It is not only unnecessary, but also inadvisable, to tilt the chair backwards. If this is done, blood and mucus will gravitate to the back of the mouth, and will either be swallowed or will impede respiration. Swallowed blood will produce nausea, and the thrusting up of the diaphragm in nausea may produce cardiac symptoms, for which the anæsthetic is not responsible. The hands lie loosely on the lap, so that the anæsthetist can test for muscular relaxation. Having ascertained that there is no obvious cardiac or respiratory disease, that the patient has had

no food for at least three hours, that all tight clothing has been loosened; a Hewitt's mouth-prop is inserted, a final glance taken at the side-table to see that appliances and remedies are at hand for dealing with any possible emergency; and the administration can proceed.

The facepiece is firmly applied so that there is no surface leakage of anæsthetic or air between the mask and the face; and the patient is allowed two or three breaths of air, breathing quite naturally; for it is not necessary to breathe deeply. The indicator is then moved so as to admit a trace of Somnoform; the strength of the vapour is increased slowly and steadily by opening the anæsthetic valve and closing the air valve, so that the patient will be breathing almost pure Somnoform in 35 or 40 seconds. In many cases, deep anæsthesia will supervene before all the air is shut off.

THE THREE STAGES.

There are three stages in Somnoform anæsthesia:

(1) *Analgesia*. The patient is conscious but drowsy, and insensible to the pain of light operative work, such as cavity preparation.

(2) *Complete Anaesthesia*. This occurs about 25 seconds from the commencement of the administration, and is marked by the loss of consciousness. The corneal reflex is not abolished, the breathing is regular, there is no stertor, and muscular relaxation is present. The patient's hand is raised gently and released in the air; if it drops without control by the patient, complete anæsthesia has been reached. If the operation is short, such as one or two easy extractions, the administration may be stopped at this stage. Otherwise, it is necessary to carry it on into the third stage.

(3) *Deep Anaesthesia*. The corneal reflex is now abolished, the pupil is moderately dilated, and the breathing marked by stertor. Two or three breaths of pure Somnoform can be allowed after the first stertor, the facepiece removed, a breath of air allowed; and the operation can commence. This procedure will give a good two minutes of surgical anæsthesia as a minimum; more often one gets nearly three minutes.

NECESSITY FOR SILENCE.

Throughout the administration and recovery there should be absolute silence in the room. Recovery is uneventful; though a few weeks ago a patient of mine, as he was recovering, suddenly shattered the glass bowl of the spittoon with a well-aimed kick! He subsequently told me that he had had a most delightful dream about a Rugby match. It is absurd to shake a patient, or shout at him to "wake up." He has had an anæsthesia simulating natural sleep; now in natural sleep we wake up quietly, calmly and peacefully, and a patient should drift back to consciousness from an anæsthetic just as quietly, calmly and peacefully. And, in dental cases, a patient should not have a mouth-

wash for at least half-an-hour. If a patient recovering from an anæsthetic is allowed to rinse the mouth it greatly increases the probability of nausea.

COMPARISON WITH NITROUS OXIDE.

It may be interesting to round off this paper by comparing Somnoform with nitrous oxide and also with ethyl chloride, at least from a dental point of view.

Nitrous oxide anæsthesia is too fleeting. As a rule it will seldom give more than a dubious 30 seconds of anæsthesia, unless some re-breathing is allowed, and that usually produces unpleasant after-effects. Text-books say nitrous oxide gives 40 seconds of anæsthesia; but, in spite of text-books, I will maintain that if you anæsthetise a patient with nitrous oxide, remove the facepiece, and allow 25 seconds by the clock to elapse, and then extract a molar tooth, the patient's subsequent comments will shed an interesting light on the length of nitrous oxide anæsthesia. Moreover, some of the phenomena of nitrous oxide anæsthesia—*asphyxia*, *cyanosis*, *jactitation*—are objectionable. They never occur with Somnoform. At the International Dental Congress in Switzerland Mr. Vernon Knowles quoted 29 deaths from nitrous oxide.

COMPARISON WITH ETHYL CHLORIDE.

That brings us to a consideration of ethyl chloride. I think that the supposed "danger" of this anæsthetic has been over-emphasized. I quite agree that it is, *potentially*, the most lethal anæsthetic we possess; that is to say, if you wanted to kill a man with an anæsthetic, you could do it quicker with ethyl chloride than with any other. But in the hands of a competent anæsthetist, it is very much safer than it is reputed. I know that the death-rate is estimated at about 1 in 10,000; I also know that you can prove anything by statistics! In a certain part of Co. Mayo, in the old days, a Government official was interviewing a prominent county councillor about a petition which had been sent up for some grant. "But," said the official, "I don't quite understand. Here is a petition with statistics to prove that in this town there is rampant poverty and unemployment; and yet, a few months ago, when you were trying to get the railway extended, you sent up statistics proving that your town was wealthy and flourishing, and a positive hive of industry. How are these to be reconciled?" "Easy enough," responded the local magnate genially, "you see those two sets of statistics were compiled for entirely different purposes."

The main objection which I see to ethyl chloride is the after-effects. Headaches and nausea are almost inevitable, and the fall in blood-pressure which accompanies the administration of ethyl chloride seems to me significant. On the other hand, I have noted that the pulse, blood-pressure, and respiration remain practically normal all through a Somnoform administration. For that reason I would say that Somnoform

is safer than ethyl chloride. It is not easy to explain fully all the grounds for this belief, because there are many puzzling facts in the pharmacology of these narcotics. For a long time the addition of alcohol has been regarded as greatly increasing the safety of the chloroform and ether combination, and we consider the A. C. E. mixture a safe anæsthetic. This may be capable of so simple an explanation as dilution of the other drugs, and perhaps the safety of Somnoform is to be explained in the same way.

AFTER EFFECTS.

It is a point on which it is well to keep an open mind. It may appear that I have dwelt unnecessarily upon after effects, but that is a point of great importance to the dentist. Barton, in his delightful book "Backwaters of Lethe," says that in the matter of giving general anæsthetics there is a subtle and deadly conspiracy against the dentist. Reputations are very easily lost in a dental surgery. In general surgery an anæsthesia may be atrocious, and a patient will be little the wiser, but in dental surgery a patient may come to with a very lively sense that there was something wrong. In dental work the ideal general anæsthetic must fulfil three conditions. The induction must be short and pleasant, anæsthesia must be deep and certain, recovery must be rapid and devoid of after-effects. If it fails in any of these the dentist's reputation is going to suffer.

In operation Somnoform is a beautiful anæsthetic. The patient retains a good colour throughout, and breathes normally. The operator can rely on a generous two minutes of deep anæsthesia. There is no struggling, or excitement, or sense of suffocation; and the patient slips into anæsthesia almost without knowing it. There are no after-effects worth talking about, and recovery is rapid. From the commencement of the administration to the complete recovery of consciousness occupies, as a rule, somewhere between five and six minutes. The smell of the vapour is not unpleasant, and if a scrap of lint dipped in tincture of orange is placed inside the face-piece it is impossible to detect the smell of the anæsthetic, even when the indicator is at "full." I have never yet had a patient who was conscious of the slightest pain while being operated on under Somnoform, though I have frequently done ten and twelve extractions with a single administration.

Somnoform can also be administered continuously by breaking successive ampoules in the inhaler as they are required. For dental work a nose-piece is used instead of the ordinary mask. Here one aims at keeping the patient just on the verge of the third stage throughout by regulating the supply of air. With a little experience this can be done with great ease and accuracy. In a continuous administration the best guide is the dilatation of the pupil; a moderate dilatation shows a satisfactory depth of anæsthesia. In this way Somnoform is eminently satisfactory for anæsthesias lasting 15 or 20 minutes. It has been suc-

cessfully administered for an hour and 20 minutes without the occurrence of any unfavourable symptoms.

For operations where the principal anæsthetic is to be ether, the use of Somnoform to induce anæsthesia has proved very valuable. It induces anæsthesia so quickly that the stage of excitement is wholly avoided, or so rapidly passed over as to be hardly noticed. This greatly reduces the amount of ether which the patient absorbs, for the Somnoform anæsthesia endures until the ether has exerted its effect.

That, Mr. President and Gentlemen, constitutes my attempt to rescue from an entirely unmerited oblivion a general anæsthetic which is eminently safe and satisfactory, and very simple to handle. It is safer and pleasanter than ethyl chloride, and far superior to nitrous oxide.

Eastman Dental Clinic In England



R. GEORGE EASTMAN, whose name is already on the roll of world-famous philanthropists, has made a new gift of £300,000 for dentistry and the promotion of dental health, and very shortly a splendid edifice devoted to that purpose will begin to take shape in London. The new building will be known as the Eastman Dental Clinic, and it is hoped it will be completed within the next two years. It will adjoin and be affiliated with the Royal Free Hospital in Gray's Inn Road, and in plan and function will be modelled on the admirable lines of the clinic established in Rochester, which was provided by the same benefactor a few years ago. There will probably be 50 chairs in the main Infirmary and 7 chairs in the Orthodontics department, and there will also be beds for the treatment of tonsillar, adenoid and cleft-palate cases.

Mr. Eastman's long-sustained and active interest in dentistry has impressed him specially with the need of better measures for improving the dental condition of children and expectant mothers. And while we here are naturally glad that a new stream of his philanthropy has fruitfully found again a channel in services for dentistry, there is, underlying the motives which actuated Mr. Eastman's very generous gift, a wider meaning and intent that make it the more memorable and significant. We have it on the authority of Dr. H. J. Burkhart, who directs the Rochester dental clinic, that Mr. Eastman had expressed the wish—and his words are surely worthy of being durably inscribed on one of the stones of the new building—that “as a mark of his affection and admiration for the British people” he would like to establish a similar clinic in London.

The generous gift by Mr. Eastman of a Dental Clinic to London has met with an enthusiastic response from our Press and will no doubt meet with an equally cordial recognition by our profession. We understand that the working of the Clinic will be arranged by English dentists on English lines, Mr. Eastman giving them a perfectly free hand. A

notable feature of the clinic presented by Mr. Eastman to the City of Rochester, is the employment of women dental hygienists who do the prophylactic part of the work. It has been suggested that the training and employment of dental nurses should form part of the English scheme, but we fancy that this idea may meet with opposition from many members of the profession. Be this as it may, we feel sure that a "demonstration," as Mr. Eastman describes it, of what a thoroughly equipped clinic can do in educating the public in the care of their teeth as well as relieving their sufferings, will be of enormous benefit and a lasting memorial to a generous benefactor.—*The Dental Record*.

The Movie Student

HERE has fallen upon us an epidemic of moving pictures portraying, or rather purporting to portray, the life of the college student, all done in the best Hollywood manner, for the edification of the Mollys and Susies of the box factory and Rudolphs and Haroldteens of the soda fountain," says the McGill Daily.

"All is grist which comes to the movie mill, but all is not flour that leaves it. Rare indeed is it to find a class or profession honestly portrayed by the bigots who pander to the public's passion for entertainment. For years we have been familiar with the movie clergyman with the sanctimonious expression and the appearance of just having eaten a green apple; we all know the movie Canadian who always speaks broken English and wears fringed deerskin leggings, moccasins, and fur cap; the movie cowboy, the movie bad man, the movie sheik are as familiar to us as our own doctor or dentist. And now to that vast throng of movie characters has been added,—the movie college man."

"The miniature world of the university is one of which, at the best, the man in the street has but the vaguest impression, and those features of college life with which they are in any way familiar have been so distorted in their presentation that the impressions they convey and the ideas they conjure up are far from the truth. In the cinema the university is portrayed chiefly as a place where football and other sports are the chief aims of undergraduate existence, and where the football player is always the most popular man in the university. The rah rah boy is almost as familiar a stage type as the monocled English aristocrat, the fat German butcher, or the mercenary-minded son of Israel. Trousers baggy, slouch hats, no garters, brilliant socks: yes, we are collegiate! And all this movie portrayal of the college man is having its effect on the general public and moulding their ideas as to what the university student is like; witness the atrocities advertised every day in the downtown store windows and the newspapers as "very collegiate." All this, of course, does little toward enhancing the honour in which university students are held."

Preventive Dentistry in England and Our Debt to the Dental Profession of America

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The first of three addresses delivered before various Dental and Medical Societies in Canada and the United States on a lecturing tour primarily organized by the California State Dental Association.

BEFORE venturing to give you an address on Preventive Dentistry, I really must thank you for the great honour you have done me. I can assure you that your invitation and your generosity in bringing me and Mrs. Sim Wallace to America are deeply appreciated, and it is difficult, if not impossible, to thank you sufficiently. To be invited by one's own colleagues in other lands to appear before them and give an address is surely the greatest compliment anyone could wish for. But to be invited to do this in the very heart and home of progressive dentistry carries the compliment to the verge of embarrassment. I quite recognize, however, that it is not upon questions relating to dental surgery as an art that you wish me to speak, since in this, you in America, hold a position of pre-eminence justly recognized throughout the civilized world. It is rather, I understand, my work in relation to the physiology of oral hygiene, and the prevention of the diseases of the teeth, about which you would like to hear me talk.

Although preventive dentistry, based on scientific principles, may be regarded as of recent origin, a certain amount of knowledge, together with empirical customs which aimed at the prevention of dental disease, has undoubtedly existed for centuries. The tooth brush is not a modern invention, and the exhortation to avoid eating sweets or highly sweetened food certainly dates back for three centuries. Before the middle of last century, however, the dental profession had commenced to give serious consideration to the scientific study of dental caries, but although many facts of importance were brought forward and great advances made, it is to the more modern work of three world-famous American dentists that I would specially refer, for it is largely upon the principal parts of their work that preventive dentistry in England is based.

THE WORK OF THE LATE W. D. MILLER.

It might be possible to form a theory with regard to the causation and prevention of dental caries without having a knowledge of its nature or pathology, and on the other hand, although we knew the pathology of the disease, it would not necessarily follow that we could explain its etiology. Nevertheless, this knowledge which we now possess certainly

allows us at least to discard many theories which even at the present day are all too prevalent. It is to the work of the late W. D. Miller that we are indebted for the thorough elucidation of the nature and pathology of dental caries. It is true that much excellent work had been done before Miller took up the subject, particularly perhaps in France, for much of the chemico-parasitical theory was dependent upon the elucidation of the nature of fermentation by Pasteur, and the experimental production of caries by Magitot cannot be overlooked. It is, of course, unnecessary for me to refer to Miller's work on this subject. It is familiar to you all. There is only one point I should like to make. Miller elucidated the subject so thoroughly and defined the nature of caries so precisely, and in this we have all followed him so implicitly, that anything which does not conform to his definition we simply do not admit to be dental caries at all. It is only necessary to refer to this because in recent years experiments have been made which have been claimed to indicate that "caries-like" lesions had been produced in certain animals by processes other than chemico-parasitical, but in as much as these lesions or developmental flaws are not of chemico-parasitical origin, they are simply not caries, nor have they the slightest or the remotest resemblance to the essential facts associated with caries. When first brought out, too much was perhaps claimed for the chemico-parasitical theory. There were many who thought that Miller's work had not only established the nature of caries, but also its etiology. It was soon observed, however, that the etiology of the disease remained more or less completely wrapped in mystery. Miller, of course, recognized this himself, and subsequent to the elucidation of the pathology of the disease, devoted many years in the attempt to solve the etiological problems. Perhaps the chief merit of his later work was of a negative nature, for it showed that we could not find any reasonable explanation of the cause of caries in the saliva or mucus or any substance contained in these secretions. Nor could it be said that his work in any way favoured the idea that there was any such thing as immunity in the enamel, although he may have shown that certain parts of the enamel, and those not usually the site of caries, might be more quickly destroyed by acid than other parts.

PROFESSOR G. V. BLACK.

You are all familiar with the knowledge that the dental profession owes to the late Professor G. V. Black. But it is only his epoch-making "Investigation into the Chemical and Physical Characters of the Teeth" to which I would here refer. In this, you will remember, he showed that the molar teeth were more fully calcified than the incisors by about 2 per cent., though molars are from 6 to 30 times more subject to decay than the incisors. The accuracy of this analysis was confirmed by Sir Charles Tome in England, and Gassmann in Germany, and Black concluded that "neither the density nor the percentage of lime salts, nor

the strength, is in any degree a factor in predisposing the teeth to caries, or in hindering its inception or progress." In another way Tomes further confirmed Black's findings. He analyzed two sets of teeth to ascertain the percentage of salts. "In one set the third molars were largely affected by caries, and incipient decay existed between many of the teeth; while in the other set, although much worn by attrition, the teeth were quite free from caries. The analysis gave 71.4 per cent. of salts in both cases."

Yet even to the present day theories based on misleading experiments on animals are brought forward to explain why the teeth are not sufficiently or properly calcified, and these demonstrably erroneous suppositions with regard to calcification are actually claimed to be the fundamental cause of the prevalence of dental caries! In view of the verified facts, could anything be a greater or more misleading waste of time?

DR. LEON WILLIAMS.

Let me now refer to the microscopic structure of the enamel. Dr. Leon Williams in his unexcelled research on the pathology of enamel showed that defects in structure, "such as pits, grooves, fissures, pigmentations, granular and amorphous enamel, are common in the lower animals," whose teeth we know are practically free from caries. With the aid of the finest lenses, and the highest magnification, added to his own almost inimitable skill and care in the preparation of sections, he was unable to discover any difference or degenerative change in the microscopic structure of the enamel of the teeth of modern civilized man, as compared with those of his remote ancestors of thousands of years ago. He noted, too, that in his judgment "the more imperfectly formed teeth—so far as inherent structure was concerned—and he meant by that the proportion of lime salts which were contained or anything other than the grosser defects such as were found in enamel in a perfectly health mouth, would never decay," while "in an unhealthy mouth—and by unhealthy he meant those conditions inimical to the preservation of the teeth—in such an unhealthy mouth the most perfectly formed tooth would never be able to resist decay." Of course, we dentists are all familiar with the obvious, we all frequently see hypoplastic teeth which have not decayed throughout a lifetime, while we see the most perfect teeth gradually becoming ravaged by the disease. Indeed, in one and the same mouth we often see hypoplastic incisors persisting in not becoming carious, while the premolars and second molars, though perfectly formed and free from hypoplasia, succumb to decay.

THE ENAMEL FROM THE CHEMICAL ASPECT.

Now consider the enamel from the chemical point of view. It has long been supposed that it contains little or no organic matter. With the best technique that science can devise, however, it is estimated that enamel

contains about one per cent. of organic matter. Now what and where is this one per cent. of organic matter in the enamel? According to Dr. Leon Williams, it is to be found in the rod sheath, and as regards its composition, we are indebted to Professor Gies for the knowledge that it is of a protein nature, presumably a sclero protein like Nasmyth's membrane, which, as he has indicated, possesses considerable elasticity. We can readily see that in the enamel this is of considerable value from the physical point of view, and it might well be regarded as a sufficient explanation of its presence and utility, but some investigators are greatly intrigued by this one per cent. of organic matter. They assume that it possesses some wonderful vital power and is able to resist the action of acids and micro-organisms. Some even claim that the highly complex phenomena associated with immunity in the blood may be possessed by this one per cent. of organic matter which is firmly embedded in the

In 1839 William Robertson, a dentist practising in Birmingham, wrote: "The only cause capable of explaining the partial operation and the particular situations of decay, is the corrosive of chemical action of the solid particles of food which have been retained and undergone a process of putrefaction or fermentation in several parts of the teeth best adapted for their reception.

inorganic enamel. When, however, we turn to the facts so ably and beautifully revealed by Dr. Leon Williams in relation to the carious process in its earliest stage, we find that it is just this part of the enamel containing organic matter which appears to allow acid to penetrate and decalcify the adjacent inter-rod substance surrounding the enamel rod.

The theory of immunity as exhibited in the blood with regard to bacteria is rational, no doubt, but the theory of immunity in enamel to the action of acid is not supported by facts or worthy of the dental profession.

We know that dentine is a hard substance chiefly of a calcareous nature, subject like enamel to decalcification by acid. We know definitely that it contains living organic matter in the dentinal tubules. But what does this undoubted living organic matter do when the acids and bacteria, associated with the carious process, break through the enamel? Does it exhibit the phenomena associated with immunity? Most assuredly it does not. It is presumed, and no doubt correctly, that the translucent zone indicates a vital reaction, but it seems to have remarkably little effect in preventing the process of decay. Indeed, we *know* that instead of resisting their onslaught, the dentinal fibrils furnish the invading

bacteria with relatively favourable channels for the destruction of the dentine. If we know that the 28 per cent. of organic matter in the dentine does more harm than good with regard to resistance to the carious process, may it not be that the less we talk nonsense about immunity in enamel the better?

For many years after Miller had definitely established the chemico-parasitical nature of dental caries there were two theories which exercised important influence in directing, or rather, misdirecting, research workers who were intent on elucidating the causes of the prevalence of the disease. I refer to the theory of the hereditary degeneracy of the teeth, and to the theory of immunity to dental caries. If the hereditary idea were believed in, as it was at least up to the beginning of this century, it is obvious that it would be in the constitution that we should search for predisposing factors. So too, if we believed in "immunity" to dental caries, it would be something constitutional which we must investigate.

THE THEORY OF HEREDITARY DEGENERACY.

I may perhaps here say that before taking up the study of dentistry I had been taught, or, had learned, that acquired characters were not inherited. In fact, I was a somewhat enthusiastic disciple of Weismann. At that time, about 1890, there were conflicting views on the subject, but with regard to mutilations, it can hardly be said that there were two opinions among scientists. This being so, it seemed to me astounding that the theory of hereditary degeneracy and predisposition to caries should have been so unquestionably accepted. Does not acid on the skin *mutilate* it; and what special difference is there in caries of the enamel? It is primarily simply a mutilation caused by the application of acid, and there is no physiological reaction to it on the part of the enamel. Whether the enamel be thick or thin, hard or soft, sclerotic or malacotic, does not really matter, for, in any case, acid mutilates it.

Here is perhaps the place to refer to some work done in England, and to note the share she took in directing the course of useful beliefs with regard to the etiology of dental caries.

A dentist named William Robertson, who practised in Birmingham, published a book in 1839, and wrote the following sentence: "The only cause capable of explaining the partial operation and the particular situations of decay, is the corrosive or chemical action of the solid particles of food which have been retained and undergone a process of putrefaction or fermentation in the several parts of the teeth best adapted for their reception." Unfortunately, towards the latter end of the nineteenth century, his work appears to have been completely forgotten, and, so far as I know, it was only a year or two ago that one of his books was discovered and the sentence I have quoted brought to the

notice of the profession. I cannot help thinking that it was erroneous beliefs with regard to hereditary degeneracy and immunity to caries that led dentists to disregard his work. However that may be, as I have indicated, the firm conviction that acquired characters were not inherited compelled me to discard the prevalent assumption that dental caries was hereditary, and led me to observe, as Robertson had done, that caries invariably was most likely to start on such parts of the enamel, or crown, as were liable to retain or lodge certain kinds of foods. Of course, when Robertson wrote, nothing was known about bacteria in fermentation. Pasteur had not even commenced to write, the role of bacteria and carbohydrates in the production of acid was unknown, and the chemico-parasitical theory of caries was not established. Further, the belief in the inheritance of acquired characters had not been overthrown, nor was it seen that the idea of immunity to caries in the enamel was an untenable belief. The data, therefore, on which I was able to start my investigations with regard to the cause of caries, were far more satisfactory than in the time of William Robertson, and led me to a re-investigation of diet, not from the nutritive point of view as medical men had done, but from the point of view of the frequency of caries.

THE RELATIVE LODGEABILITY OF FERMENTABLE CARBOHYDRATES.

Perhaps you may be aware that my earliest work was in the nature of a simple attempt to find the relative lodgeability of fermentable carbohydrates. For as it appeared to me, the essential question with regard to causation was whether fermentable carbohydrates lodged unduly in the crevices and retention areas so as to furnish the pabulum necessary for the proliferation and activity of the acid-forming bacteria. I made many observations in my own mouth with regard to different articles of diet, and frequently was able to get much useful information about the dietetic habits of my patients. I took a similar interest in the non-fermentable carbohydrate cellulose and various other articles of diet which were known not to give rise to acid fermentation. It soon became evident that there were various accessory food factors which, though in no way directly conducive to nutrition, were of great importance from the point of view of dental and oral hygiene. Let me dwell briefly on these accessory food factors to which I refer. Cellulose generally occurs in natural food in a somewhat fibrous form, and the mastication of this tends to clean certain surfaces of the teeth. We see that this is conducive to oral hygiene, but it is not appreciably nourishing to man. It is not necessary to refer further to this, since the idea is fairly accepted, and Dr. Percy Howe has generously corroborated my views with regard to cellulose and the roughage in vegetable foods generally. Next, we may have food of a certain physical con-

sistency, which, too, necessitates mastication. But the physical consistency of the food, though it may be detergent or cleansing with regard to the teeth, is not nutritious.

THE EFFECT OF ACIDS.

Again, I drew attention to the effect of such acids as may occur in natural foods, and explained why these acids were not only not harmful, but actually beneficial from the point of view of oral and dental hygiene, and you may remember that a number of years afterwards, Professor W. E. Gies, of New York, amply and likewise generously corroborated my views. I also referred to "bitter, pungent and stimulating principles" in the food, because, like acids, they caused a copious flow of saliva, which I regarded as the natural mouth wash that should be stimulated while "soft, alkaline, insipid," milk-soaked diets, such as were generally given to children, were condemned. Since referring to these factors more than 20 years ago, the value of acids in the food has been taken up by members of the dental profession, by some, too enthusiastically; indeed attempts seem to have been made to overshadow other important food factors by a much too enthusiastic and exclusive insistence on the value of acids. Second-hand versions of new ideas are often misleading and unsatisfactory, especially when the real source of the ideas is not divulged, and Professor Gies was well justified in drawing attention to the fact that recognitions of priority "help to define the limits of knowledge, to show the sources and to indicate the reliability of information, and through the penalties that follow discovered plagiarism and other forms of misappropriation, to prevent the demoralization of literature, as well as the confusion of the records of Science."

I am inclined also to think that the vitamin craze looks only like a wild magnification of the idea of the "stimulating principles" referred to.

PHYSIOLOGY OF MASTICATION.

Associated throughout with the study of these accessory food factors, there went corresponding enquiries into the physiological processes in the mouth which those factors set up. One of the first to attract attention was the physiology of mastication. I tried to show that the description of the process as given by physiologists was erroneous and misleading. It represented mastication as a process for the making of a bolus to be lubricated with saliva and mucus in order to facilitate the lump thus formed being swallowed. Whereas, my contention was that anything in the nature of a bolus was disintegrated during mastication and swallowed in liquid or semi-liquid form. If my view be true, and it is so regarded by dentists in England, then it seemed to follow that the intimate mixture of the disintegrated and semi-liquid

food that reached the stomach, would allow the gastric juice to permeate the more readily into its contents, because of the precipitation and curdling of mucus by acid. This is, of course, the antithesis of what some physiologists at the present day suggest. With regard to saliva, the idea gradually dawned on me that its function was not primarily to digest starch, but rather to flush the mouth and keep the teeth and gums in a healthy condition. Two principles of importance originated from these conceptions. The first was that the physical consistency of food for young children with a complete set of temporary teeth ought, in general, to be such as would demand efficient mastication and stimulate the glands of oral hygiene. The second was that in the event of non-fibrous food being eaten of a physical consistency, making it liable to lodge about the crevices of the teeth, this should be followed by foods of a detergent nature.

It is, of course, impossible in a short address to recapitulate all the points brought forward, together with reasons for insisting on the necessity of recognizing them, nor can I attempt to reproduce the evidence which helped me to formulate guiding principles of dietetics, and more especially the principles of dietetics for children. I would, however, like to refer to some incidents which have happened in England. Let us go back to 1900, for as we have recently been informed by the *British Dental Journal*, in that year, "one of the most controversial and epoch-making works in modern preventive dentistry appeared." At that time the chemico-parasitical theory had become thoroughly established and the responsibility for what took place in the teeth was so directly traceable to the micro-organisms in the mouth, that the dental profession was practically unanimous in urging preventive measures to be taken in such a way that these micro-organisms should be killed with antiseptics and cleared away with the tooth brush. It was supposed that carbohydrates in the diet necessarily favoured the acid forming bacteria which destroyed the teeth, but, of course, it was obvious that carbo-hydrates could not be excluded from the dietary, more especially such carbohydrates as bread and potatoes, which Miller considered the best able to cause rapid acid fermentation. In fact, at that time preventive dentistry amounted to little more than tooth-brush drill and the use of antiseptics, together with a few variations in methods and specifics used.

PREVENTION OF CARIES.

I believe that in the schools in England, these procedures were quite a failure from the point of view of the prevention of caries. It was even pointed out in high scientific circles that in the upper class schools in which the tooth brush was used, the teeth were more subject to caries than where it was not, that is to say, in the poorer class schools, while dentists were repeatedly confronted with the failure of those who claimed to follow the preventive methods most carefully, and they lapsed

into the habit of blaming the continued increase of the disease on hereditary and constitutional cause.

To me, these methods of prevention seemed very ineffectual. My early training had been in science, and more especially in biology, and so, naturally, my first book, written in 1900, was rather a defence of the principles of biology I had learned, for to me it was evident that the principles and practice of preventive dentistry, as then taught, were unwittingly based on the assumption that the principles of biology were erroneous.

Though the text-books which appeared before 1909 contained little more than such remarks as would indicate that my views were of little importance, as time went on, they generally became more recognized. Sir Frank Colyer introduced them in his well-known text-book, and Mr. N. G. Bennett asked me to write the section on the Etiology of Dental Caries in his. In fact, my views became "official" amongst dentists in England, and as the cause of the prevalence of dental caries was recognized so too was the fact that it was a preventable disease. In addition to this, a few physicians who wrote books on the care of children took notice of some of the new dietetic principles and two or three of these have had a considerable effect, for they were and still are, widely read by medical men, and as some books on the care and feeding of children became well recognized guides for mothers, direct instruction was brought home to those who had children to bring up. Some doctors were indeed perhaps too enthusiastic and sweeping or "previous" in their pronouncements.

DIET IN CHILDHOOD.

Thus in a leading article on "Diet in Childhood" in the "Universal Medical Record," in 1912, it was said that "in the last few years the diet of children has been entirely reconsidered. Much of the traditional feeding has been rejected, and in its place a carefully thought-out dietary, based on scientific principles has been established," and, moreover, generously added that "it is to the dental profession that in the main we owe these advances." So, too, a few medical officers of health, whose duty it was to instruct the public on the prevention of disease, got interested in the subject, and some of them seemed to prefer the views of us dentists on diet for children, to the views of the majority of children's specialists. Notable among these was Dr. James Wheatley, M.O.H. for Shropshire. After studying the subject thoroughly for himself, he brought it forcibly before the medical profession in his branch; he lectured to the school teachers, nurses and health workers and prepared leaflets for the instruction of the parents in his county. The result of his campaign was so striking, that a few figures may here be given:—

From the following table, you will readily notice a decrease in dental

caries as a result of the practical application of the dietary reforms advocated. It is a comparison of the inspection of 37,527 school children in the pre-war years, 1910-1914, with the inspection of 10,593 school children in 1919, and the first three months of 1920.

Year.	Age 5.		Age 12-13.	
	No. of caries teeth per child.	Percentage free from caries.	No. of caries teeth per child.	Percentage free from caries.
1910-14	6.4	5.0	4.6	2.9
1919 (last three months)	2.1	42.0	2.1	26.0
1920 (first three months)	1.9	48.0	2.1	28.3

Dr. Wheatley recognized and admitted that these results were to some extent due to war conditions, for example, a distinctly curtailed amount of sugar, sweets and milk. But that it was largely due to the campaign of instruction which he inaugurated in his county is made evident by the fact that other counties did not show nearly such good results. Observations with regard to the decrease in caries have been made in various other counties and towns, and though not so striking, the decrease has been easily observed. It is notable, too, that in Birmingham where, as regards large towns, our principles were first officially taught to nurses, school teachers, and health workers generally, the decrease in caries has been more marked than in other towns. Roughly, altogether, I think it may be calculated that there has been at the very least a 20 per cent. reduction in the amount of caries among school children when we compare the pre-war and post-war periods. This means that in England there has been a reduction in the number of carious teeth *in school children alone* of considerably more than ten millions, while among children of pre-school age there has been a more pronounced reduction. This is a conservative estimate and it would probably be within the mark to say that there has been a decrease of twenty million carious teeth among children of pre-school and school age. Although statistics are not available, it seems to me probable from general observation, that the decrease in caries is greater in the upper classes than among the poor. This has presumably resulted from the well-to-do being more responsive to the new views on dietetics and oral hygiene than the poor.

The wisdom in the new principles in the feeding of children and the excellent results already obtained, probably accounted for the recent action of the Society of Medical Officers of Health in electing a committee to draw up a leaflet for the guidance of parents. In it you will observe that the older insipid pap feeding principles of children's specialists have been discarded, and rational principles based largely on the teaching of dentists whose special concern was the physiology of oral hygiene have been adopted. It is not long and I shall read it *in extenso*.

PREVENTION OF DECAY OF TEETH.

(Leaflet for the Use of Parents.)

This leaflet, which has been approved by the Council of the Society of Medical Officers of Health, reads as follows:

Decay of teeth is caused by the fermentation of food that sticks on or between the teeth after meals. Acid is formed from the food, and this acid eats a hole into the teeth. It is only the "starchy" and "sugary" foods (see below) that form acid in the mouth.

It is most important that the jaws should be well grown and the teeth regular. This is brought about by breathing through the nose from birth onward, and by chewing and gnawing. If the jaws are small and the teeth overcrowded, mastication (chewing) cannot be properly performed, and the food will be left clinging to the teeth after meals and the teeth will decay.

In order that the jaws and teeth shall grow properly and the teeth kept clean and free from decay, you should observe the following rules:

(1) As soon as infants need food other than milk (8 to 9 months) give it in a solid form, such as crusty bread, twice baked bread, or crisp toast, thus compelling mastication. Do not give bread soaked in milk or milk thickened with flour or other starchy foods, such as most patent foods. Encourage the child to chew and see that it breathes through its nose. In these ways good habits of mastication will be formed.

(2) As the child grows up you should still give most of the food in a solid form, compelling mastication. Food, other than milk, should rarely be taken in a liquid form. Vegetables and meat should not be minced and soaked in gravy. Bread should not be eaten new, and it should have plenty of good firm crust.

(3) After the first two or three years of life the child should have three meals a day and no food between.

(4) It is not advisable to drink at meal times, but plenty of water should be taken between meals. Milk is a food, and should only be taken at meal times, and must be followed by a tooth cleansing food.

(5) All meals should be finished with a cleansing food. (See below.)

(6) Sweets, chocolates, and biscuits are very harmful to the teeth, if taken the last thing at night. They should only be taken at meal times, and should be followed by a cleansing food. The custom of giving milk and biscuits the last thing at night should not be allowed.

(7) Correct feeding and chewing are the best means of preventing decay of the teeth, though the intelligent use of the tooth brush will be found helpful.

If decay of the teeth or tenderness of the gums is noticed, the child should be taken to a dentist. Such conditions prevent mastication and bring about further decay. It is important for the sake of the child that the nursing and expectant mother should also go to the dentist if her teeth are in a bad condition.

Examples of food referred to above.

Starchy Foods.—Potatoes; rice, tapioca, sago; bread, biscuits, etc.; oatmeal porridge; most patent foods.

Sugary Foods.—All foods to which sugar is added; sweets of all kinds; honey, syrup, jams, marmalade; milk.

Tooth Cleansing Foods.—Fresh fruits: apples, oranges, nuts; raw vegetables; lettuce, watercress, celery, radishes, onions; crusts of bread, crisp toast, twice-baked bread; meat, fish, bacon.

Simple and unpretentious though this leaflet may be, we dentists have, I believe, reason to be proud of it, for it is evident that the dietetic principles now authorized by the Society of Medical Officers of Health in England, resulted from a recognition of our work. Nevertheless, it can hardly be said that we have as yet by any means reached our objective. As already indicated, it is probably true to say that through the diffusion of the knowledge of correct principles of dietetics, the amount of caries in school children in England has already been reduced by more than 20 per cent. But if the community is to reap the full benefit, it is of special importance that all teachers and leaders of thought should become acquainted with the new knowledge. So far it must be admitted that physiologists and the majority of medical men do not even recognize that there is such a thing as the physiology of oral hygiene. Nor do they know that the primary function of the saliva has been discovered, and their knowledge of the physiological process of mastication is so limited, that they still imagine a bolus is formed in the mouth to be lubricated with saliva and mucus, to be slipped down into the stomach as such.

It is then for us dentists to teach them the physiology of oral hygiene, and show them the necessity of recognizing the value of *all* such accessory food factors as are conducive to this end. The physical consistency of the food, fibrillar matter, more especially cellulose, food acids, aromatic and pungent flavours and stimulating principles, must *all* be taken into account. It will not do to confine attention to such stimulating principles as vitamins alone. Fortunately, the conceptions resulting from the study of oral hygiene have lead to similar beneficent ideas with regard to alimentary hygiene, and the benefit derived from correct teaching does not appear to be limited to the decrease of dental caries, for not only has this disease decreased, but the general health of the children has also improved. Thus may we hope that dietetic experts, physiologists and medical men generally may soon join in in promoting what promises to be the most notable triumph of preventive medicine

Gentlemen, I have tried to give you an indication as to how the problem of the prevention of the diseases of the teeth is being solved in England, and notwithstanding ignorance of biological principles, prejudices, food fads, vested interests, difficulties incidental to the diffusion of knowledge and the obstruction caused by conflicting, erroneous, and long-rooted theories, substantial progress has assuredly already been made.

* The coarse whole-meal flour is best for this purpose.



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Saskatchewan—C. W. PARKER, D.D.S.
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Maritime Provinces—J. STANLEY BAGNALL, D.D.S., 34 Larch Street, Halifax, N.S.

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Provincial Editors will appreciate receiving from all local societies copies of papers, society proceedings or personal notes, for publication.



MARITIME PROVINCE NOTES.

DR. J. A. RUTLEDGE, LL.B., gave a most interesting talk on "Some Phases of Contract and Tort Law as affecting the Medical and Dental Professions," at the April meeting of the Halifax Dental Society, in which he dealt particularly with the questions of contract and malpractice actions. The bulk of dental cases are decided according to the precedent of the same or similar cases which have been already decided. There have been relatively few dental cases in Canada, and the precedent for the decision of cases rests on the decision in cases in England and in those States where the law is founded on the English Common Law, also on similar cases in Medicine. A most important element in the decision of cases rests on the testimony of other dentists, and while there should never be any attempt to shield dangerous and harmful methods of practice, it should be always remembered that criticism, either in court or without, of a case where the critic does not know all the facts, may be directly harmful to the dentist in question and to the profession as a whole.



MANITOBA.

THE April meeting of the Winnipeg Dental Society was addressed by E. W. Montgomery, M.D., diagnostician, who has for many years been a member of the staff of Manitoba Medical College. Dr. Montgomery's address dealt with "Pre-medical and Pre-dental Education," a subject now engaging the

attention of our dental schools, and I shall endeavour to outline carefully his observations.

There was no distinction in the educational requirements for physicians or dentists, as Dentistry was the oldest specialty of Medicine. Manitoba Medical College has 800 graduates and had now reached the point where it had more applicants than it could accept and had to decide who would be refused and why. The proper type should be encouraged. Requirements had been gradually increased until recent years when, after reaching University matriculation standing, a student was required to take two pre-medical years of study before entering Medical College here. He had been conducting a quiz of medical students as to their opinion of value of the two pre-medical years, also students' reasons for entering medical course. The two pre-medical years were so light that they did not require night study, resulting injuriously to some on account of too many free nights and difficulty in again getting settled to real studies in first year of medical course. The University here controls the curricula of the two pre-medical years. He believed if there was not a natural thirst for scientific knowledge or one created in the student by the end of the two pre-medical years, the time had been wasted. He asked the assistance of dental associations in a movement to have pre-medical and dental curricula under the control of the Faculties concerned or permit a canvass of students in these classes so as to accept only suitable material.

* * *

Election of Officers for 1927-28 season resulted as follows:—

President—B. E. Brownlee.

Vice-President—K. M. Johnson.

Secretary-Treasurer—Ben Toombs.

Executive—H. Hodgson, J. W. McLeod, W. Riley.

—W. W. W.

* * *

ALBERTA.



At the annual meeting of the Calgary Dental Society held on Monday, April 26th, 1927, the election of officers for the ensuing year took place. The following are the officers chosen: President, Dr. A. C. Steeves; Vice-President, Dr. Harvey Duncan; Sec.-Treas., Dr. B. J. Charles.

The programme for the evening consisted of a debate on the following subject: "Resolved that all pulpless teeth should be removed." The affirmative was conducted by Dr. W. Duncan and Dr. Macaulay, and the negative by Dr. T. Skinner and Dr. W. F. Piper.

The status of the pulpless tooth is still unsettled.

SASKATCHEWAN.

MOOSE JAW DENTAL SOCIETY.



THE election of officers of the Moose Jaw Dental Society, for the coming year, took place at a recent meeting of the Society, with the following result:

President—Dr. R. H. McDougal.

Vice-President—Dr. Leslie Hare.

Sec.-Treas.—Dr. E. J. Hill.

Montreal Dental Assistants' Association



THE officers and members of the Montreal Dental Assistants' Association are to be congratulated upon the completion of a most successful series of meetings, held during the past season. The organization appears to be established upon a firm basis, and similar societies would certainly be of great service if organized in other large centres. Apart from the social advantages, the exchange of ideas is quite helpful, and the members of the profession who contributed to the programmes presented material of a practical nature and calculated to make the assistant's work more interesting to herself and more satisfactory to the Dentist.

At the last meeting for the season Dr. Precost D. Mowry lectured upon the subject of "Hygiene and Ethics." Dr. Mowry, during the discussion, pointed out that the laws of Quebec forbid the practice of prophylaxis by other than a registered Dentist and that more harm than good might be done by one inexperienced.

Average Length of Life Extended Fifteen Years



HERE is a popular notion at large that the average span of life is decreasing. "Upon advice of distinguished statistical counsel, I can assure you that such is not the case. Life has been lengthened materially, even in the last twenty years. Between 1911 and 1922, the mortality rate, from all causes in the registration area of the United States, decreased from 14.2 to 11.8. In New York State, during the same period, it decreased from 15.7 to 13. In New York City, from 1910 to 1922, it declined from 16 to 11.9. In the last sixty-five years, the average length of life has been extended fifteen years.

"New discoveries, utilization of recently acquired knowledge, closer application of accepted principles of hygiene, improved working and home conditions—these are the things counted on to bring about further decreases in the death rate."

Public Dental Health Education

"The public has decided it wants health talk and means to get it! The lay press is the most powerful medium of instruction for the public in health matters. We must do our best to secure its co-operation!"—Sir Thomas Horder.

IN this department each month will be published short articles suitable for use in the public press. The material has been authorized by the Oral Hygiene Committee of the Ontario Dental Association and members of the profession may feel free to arrange for its publication in the local papers or magazines.

THE WISDOM TOOTH.



OTHERWISE the third molar, the word "Wisdom" being of no real significance excepting as it relates to the period of eruption, which is at the approach of adult age.

Perhaps it has been your good fortune not to have had this tooth erupt, for in truth it is often a trouble bearer; it is the dental "degenerate"—generally stunted in size, but frequently absent altogether. But why missing?

This—the gradual lessening of the function of mastication and the reduction of the force of jaw movement, due to the substitution of softer and less gritty foods by civilized man—has led to a marked degeneracy of the dental mechanism.

So that, through economy of growth, due to disuse, the tooth germ may fail to develop; or, developing, the jaws are so greatly contracted (through disuse) that frequently there is lack of space for it to erupt into position—a condition analogous to that of the eyeless fish of the Mammoth Cave—Nature cutting off that which goes unused.

Just a word more: Occasionally the unnatural retention of this tooth in the jaw—so-called "impaction"—leads to serious disturbances—neuralgic pains, local infection, or constitutional ills. So when your physician, finding no specific cause for your general ill health, orders that "impacted" wisdom tooth removed, you will better understand the reason.

But don't worry should the wisdom teeth not erupt—the chances are that you have been spared trouble.



MISSING TEETH.



OUR son is now grown up and should have his full complement of teeth, which is thirty-two.

But the probabilities are that one or more are missing.

Now, of course, the most probable cause for this deficiency is the extraction of earlier years, which you may have forgotten. But,

on the other hand, there may be this reason, that the "one or more" did not erupt.

The teeth more prone to non-eruption are, in the order named: the third molar, upper cuspid, upper lateral, and lower second bicuspid.

Then let us enumerate the causes of non-eruption of missing permanent teeth:

1. An abscessed condition of a temporary tooth might destroy the germ of the permanent successor.

2. The premature extraction of a deciduous tooth might destroy, through injury, the permanent tooth germ beneath, or dislodge it entirely.

3. Childhood diseases accompanied by high fever, such as scarlet fever and measles, might, through their general disturbances, injure irreparably the tooth germ.

4. The retention, unduly long, of a temporary tooth, might prevent the eruption of its successor.

5. In the case of the cuspid, sometimes it is fully formed, but having taken up a position more or less horizontal, back of the incisor teeth, it fails to erupt.

6. With the third molar, we find that it is due to lack of room to erupt that it remains impacted in the jaw—quite as frequently it does not form at all.

So you observe that a tooth may be missing due to one of several causes; for the most part, they are preventable, Nature intending that each one should have his full complement of teeth.



THE CANINES.



YOU have referred to your dog Rover as a canine—that is what he is! This tooth, then, that is the first in line behind the incisors, is called the canine, from being extra well-developed, as in the dog and other carnivorous animals.

It is the most primitive type of tooth, and is known also as the cuspid, and as the "eye-tooth," this last being merely a popular designation.

Being observant, you have likely noticed that of the temporary teeth this was the last to be lost—serving thus to keep the upper and lower ridges in right relationship for their permanent successors during the process of shedding the temporary teeth.

But it may be that it remained in place unduly long, for not infrequently in the upper jaw, the permanent cuspid, though developing, does not erupt, in which case the temporary cuspid should be retained as long as it remains firm and sound, depending solely on the advice and responsibility of your dentist.

Now, notice this point: Overlying the root of the upper canine is an elevation, the "canine eminence," which serves to keep the tissue at the

angle of the mouth well filled out. Then should you lose this tooth, this eminence disappears, with the resultant falling in of this tissue, giving you prematurely the appearance of age.

So if you would keep your youthful appearance, beware! See to it that your "eye-tooth" stays sound and free from the clutches of your dentist's forceps.

* * *

THE BICUSPID.



COUNT them—two in line back of each cuspid, making eight all told.

Bi-(two)-cuspid—(tooth with one point or "cusp")—so this, then, is a two cuspid tooth.

(You have doubtless observed, however, that the inner cusp of the lower tooth is but rudimentary—a modified form of the original full cusp.) Then they are also called pre-molars—again our Latin—"pre" meaning "before"—you see why?

This tooth erupts generally from the tenth to the twelfth years, and though chiefly utilitarian, yet it serves a cosmetic function as well. To prove this, save up your best joke and tell it to your neighbour—then slyly observe the open space marking a missing bicuspid which you had probably not noticed before.

To paraphrase: "Loud laugh betrays the vacant space."

Now, there is a danger peculiar to the upper bicuspid which is this: This tooth lies in a position just below the "antrum" or air sinus that is situated in the large facial bone, the upper maxillary, and frequently just a thin shell of bone forming the floor of the antrum separates the latter from the ends of the root or roots.

Should, then, decay proceed so far in this tooth as to infect the pulp, causing it to die, with a resultant abscess—it occasionally happens that pus will burrow into the antrum, infecting it and with dire consequences—generally necessitating an operation at the hands of the surgeon.

Tell your dentist that you want your teeth *kept well*, not just made well. The responsibility is then his.

* * *

THE MOLARS.



CONSIDER for a moment the military "machine" in greatest prominence, the officers, carefully groomed; next the "sous-officers"; and in the background, the rankers—who bear the brunt of battle.

Now then, consider the masticating "machine"—In the forefront, the incisors and canines, well kept—next behind the bicuspids, and to the rear, the molars—you catch the simile? Twelve is their mustering strength, six upper and six lower, though this number is variable, since

frequently the third molar is missing, while again a fourth molar occasionally presents.

Now, a word about their roots. You have, perhaps, had the "nerve" removed from one of these molar teeth, which operation proved very tedious, necessitating your return two, three or four times for treatments—until you wished that you had had the old tooth taken out.

It is precisely because of the difficulties attending the management of these teeth, when badly diseased, that you should be on your guard to notice any trouble in its beginning and have it checked.

But, of course, you can have them "pulled!"

Well, take your lawn-mower. Strip it of one or more of its blades. With what efficiency will it do its work? Diminished indeed! Suppose then, that you lose a molar, or two, or three, or six, or ten of them—how much masticating efficiency is left you? Very little! And what prospect for good health? Poor enough!

So, if you would live long and healthfully, guard well these ranks and see to it that they remain unbroken.



TOOTH STRUCTURE.



YOU examine the highly polished clean tooth surface and you conclude, and rightly so, that the enamel does not persist all the way through.

As the bark is to the tree, so the enamel is to the tooth its protective covering, but serving as well the purpose of ornamentation of the tooth body.

In the tooth this body, which constitutes the main bulk of the tooth, is known as the dentine.

Then is this all? No, for as in the tree we have a pith or core, so in the tooth we find a central chamber known, in the crown of the tooth, as the pulp chamber, and in the root as the root canal.

But you have observed, too, that the enamel covers only the exposed portion of the tooth, or crown. The root, then, is protected by a covering known as cementum, which attaches the myriads of fibres or "threads" that hold the tooth firmly in place in its socket.

Nature, ever wise, has constituted the enamel the hardest substance in the human body, to better withstand the stress to which it is subjected. Also, enamel does not undergo the physiologic changes of dissolution and repair to the extent of any other body tissues, hence the need of hardness as an effective barrier to injury and disease.

In the dentine are minute tubules, or canals, containing soft tissue filaments through which communication is established from the outside of the tooth to the nerve tissue of the pulp; and because of this honey-combed structure and, too, owing to dentine being softer than enamel, it is less resistant to disease than is the latter.

So you can see how important it is to keep intact the enamel which

constitutes the outer defences of the tooth, since disease processes, once penetrating the enamel barrier, can quickly gain access to the more vital tissues within and there proceed apace to work disaster.



THE TOOTH "NERVE."



YOU know, of course, that a tooth is not solid right through, but is hollowed out in the centre to form a chamber; and, because of sad experience, perhaps in a dental chair, you have been made aware that a tooth does possess a "nerve."

But you gave no thought possibly as to whether this chamber contained other forms of tissue or not.

Now, as a matter of fact, it does; and the so-called "nerve" is known as the pulp, which tissue is a mass of almost gelatinous character containing minute blood vessels and nerve filaments.

So it is not just a glistening string like a piece of nerve tissue, as you may have supposed.

When the tooth erupts, the pulp chamber is proportionately large, but with the tooth practically fully formed the need for tissue forming elements is largely past. So the blood supply is cut off more and more with a progressive narrowing of the pulp chamber until, in advanced life, it is sometimes altogether obliterated.

This accounts for the fact that tooth decay can more quickly do great havoc in the child's tooth than in the adult's.

You dread the dental engine, and at the first touch of the "drill" to the tooth you are sure the dentist has struck the nerve because of the pain produced.

However, this sensation is being carried merely by minute fibrils that lie in the dentinal structure, while the pulp containing the nerve proper has gone undamaged.

Remember this: that the power of healing in the pulp is very low and, once infected, the chances of its recovery to health are extremely slight.

For which reason you should be on your guard to head off tooth disease in its earlier stages.

Chosen as Member of Canadian Golf Team



R. W. M. McGUIRE, of Simcoe, has been chosen as a member of the Canadian Senior Golf Team to compete in the International Senior Golf Championships to be held in England in July of this year. Congratulations, Dr. McGuire!

DIRECTORY of DENTAL MEETINGS & OFFICIAL ANNOUNCEMENTS

*Dental Associations are Invited to use this Department Freely for
Announcements of Meetings.*

EASTERN ONTARIO DENTAL ASSOCIATION, Stanley Island, June 22-24, 1927

THE AMERICAN DENTAL ASSOCIATION—Detroit, Mich., October 24, 25, 26, 27, 28, 1927.

Officers of Canadian Dental Organizations

*Oral Health will be pleased to Receive Additions or Corrections that Directory
of Names May be Kept as Accurate as Possible.*

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l Surgeons of B.C., Vancouver, B.C.

Obituary

THE LATE A. M. CLARK, D.D.S., WOODSTOCK, ONT.



THE LATE DR. A. M. CLARK.

Surgeons of Ontario as representative of District No 5. In his connection with this body he was a member of the committee which had charge of the erection of both the old and new college buildings. He was for many years a member of the Discipline Committee and was Chairman of the Board of Examiners throughout his entire membership of the Board. From 1893 to 1899 he was its Treasurer, and from 1899 to 1901 he was Chairman of the Board.

Dr. Clark was prominently associated with the development of the Woodstock General Hospital. He first took his seat on the Board of Trustees in 1901 and was a prominent figure in its progress and extension until he retired from the Board, owing to ill-health, four months ago. He was a Presbyterian in religion, and for thirty-six years he was a member of the Board of Managers of Knox Presbyterian Church of Woodstock. He was a Past Master of Oxford Lodge, No. 76, A.F.

DR. ANGUS McPHERSON CLARK, one of Woodstock's most prominent citizens for over forty years, and a leading figure in the dental profession of Ontario, died at his home on Wednesday, April 27th, 1927, after an illness of some months' duration. Dr. Clark was in his 68th year, having been born at Morriston, Wellington County, in August, 1859. He was educated at Rockwood Academy and Collingwood Collegiate Institute. For a few years he taught school at Burlington and then entered the office of the late Dr. William Foster, of Guelph. He graduated from the Royal College of Dental Surgeons in the Spring of 1886, and since then practised in Woodstock. Professionally, Dr. Clark was one of the foremost men of the Province. For

twenty years he was a member of the Royal College of Dental

and A.M., and less than three years ago received the exceptional honour of having the 33rd degree, the Scottish rite conferred on him. He was also a Past President of the Woodstock Amateur Athletic Association, and until prevented by illness was actively interested in the bowling club and the curling club, in both of which he held the office of President.

Dr. Clark is survived by his widow, formerly Miss Margaret White-law, and two daughters, Miss Marjorie and Miss Rowena Clark, both at home, and his brother, Dr. Donald Clark, of Grimsby.

The passing of Dr. Clark leaves sincere regret in the hearts of those who knew him, and an abiding memory of a true-hearted, Christian gentleman, who rendered great service to his chosen profession through the many years of his active professional life.

Medicine and Dentistry in Ancient Times

 HE art of medicine in Egypt is thus exercised: one physician is confined to one disease; there are, of course, a great number who practise this art; some attend to disorders of the eyes, others to those of the head; some take care of the teeth, others are conversant with all diseases of the bowels; whilst many attend to the cure of maladies which are less conspicuous." (*Quotation from Herodotus, Egypt, History Book 2, Euterpe, paragraph No. 84.*)

The Wisdom of the Strong

A little pluck when hope burns low,
 A little laugh when life seems slow,
 These are the things that wise men know
 Are you wise?

A little faith in one who's dear,
 When Mischief whispers at your ear,
 And holds the God of Doubting near
 Your shrinking eyes.

A word of praise to help along
 A wearied traveler in the throng.
 This is the wisdom of the strong—
 Are you wise?

Oral Health

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Vol. 17

TORONTO, MAY, 1927

No. 5

EDITORIAL

Our Wider Relationships as Citizens of Canada



S Canadians we celebrate this year the Sixtieth Anniversary of the Federation of the Dominion of Canada. The first meeting of the Ontario Dental Association was held in the town of Cobourg, July, 1867, the same month and year as the Confederation of the Dominion, and was one of the first efforts in Canada to organize the dental profession into Provincial Associations. Thus the history of organized dentistry in Canada and that of the Dominion of Canada itself are somewhat contemporary. This circumstance serves to emphasize our wider relationships as citizens of Canada.

As Canadians we have a wonderful heritage; and as college men and members of a profession, it is our duty and privilege to play the part of good citizens, not only in our local communities, but to foster in every way in our power, a more sympathetic attitude in our own province toward the difficulties to be faced by, and the language and customs of, the other provinces of the Dominion. The reasonable contribution to expect of the dentists of Canada toward their country

is that they develop and maintain a strong, rugged, national organization that may not only serve Canadian Dentistry, but Canadian Patriotism and Unity.

Someone has aptly said that modern "specialization" has come to be "the art of knowing more and more about less and less." Dentistry is a highly specialized profession and we must protect ourselves from narrowing influences. We must maintain those contacts with the larger streams of thought and life that hold broad interests and a broad understanding of life. In these days of highly concentrated effort every man has to guard against becoming restricted into a smaller sphere wherein he knows less of the world and can see less of it, and should develop interests outside the confines of his own profession. Canada's Diamond Jubilee reminds us of our responsibilities to our native land, and will undoubtedly stimulate us to greater public service.

The remarkable development of modern dentistry might be almost encompassed within the sixty-year period marking the Confederation of the Dominion of Canada. But notwithstanding the splendid advances of the past, as a profession we may face the future with the greatest degree of optimism, conscious that the developments of the next sixty years will be even greater than the past. We shall have newer knowledge and broader application resulting in a constantly improved dental health service for the people, and a higher type of Canadian citizenship among the members of the Dental Profession.

Entire C.D.A. Executive Re-Elected



At the general meeting of the Canadian Dental Association held in Toronto on the 18th May, 1927, the President and all of the other officers were reappointed for the ensuing year, it being the unanimous decision of the members that it would be unwise to make any change in the Executive during the transition from the old form of organization to that of the Board of Trustees to be appointed by the Provincial Dental Associations of the Dominion.

It is the intention that the C.D.A. should continue as a purely voluntary organization composed of Trustees appointed by the voluntary dental organizations of the provinces and thus have no official control over, nor interfere in any way with, the licensing functions of any of the provincial dental boards.

Doctor John Clay has done good work as President during the past year. It was natural that there should be differences of opinion when such radical changes in organization were being contemplated, but everyone will agree that Doctor Clay has served at great personal sacrifice and with undoubted fairness to all of the many interests concerned. The President and the Secretary, Doctor J. Stanley Bagnall, carried

the greater share of the burden during the year and deserved the appreciation of the Association as expressed by several members at one of the sessions.

The Officers of the Canadian Dental Association and the Delegates appointed from the provinces were greatly encouraged by the progress made at the Toronto meeting, and count upon the united support of every province of Canada in their efforts to overcome the difficulties that have operated to seriously interfere with the development of a Canadian Association that would be more commensurate with the progress that has occurred throughout the profession itself.

The complete proceedings of the C.D.A. meeting will be published in an early issue of Oral Health along with an outline of the new constitution of the Association.

Personal Sketch of the President of the C.D.A.



NE of Doctor Clay's personal friends forwarded the following humorous sketch to the Editor with the request that the author's name be not appended:

"John William Clay was born in the city of Halifax, Yorkshire, England. While he cannot remember the occurrence, himself, he is quite positive of the fact. Being quite a sturdy youngster, he learned to walk at an early age, and when three years old, set out for Toronto, Canada. While he is a staunch Canadian and proud of his country, he looks back on those three years in Yorkshire as the most youthful days of his life.

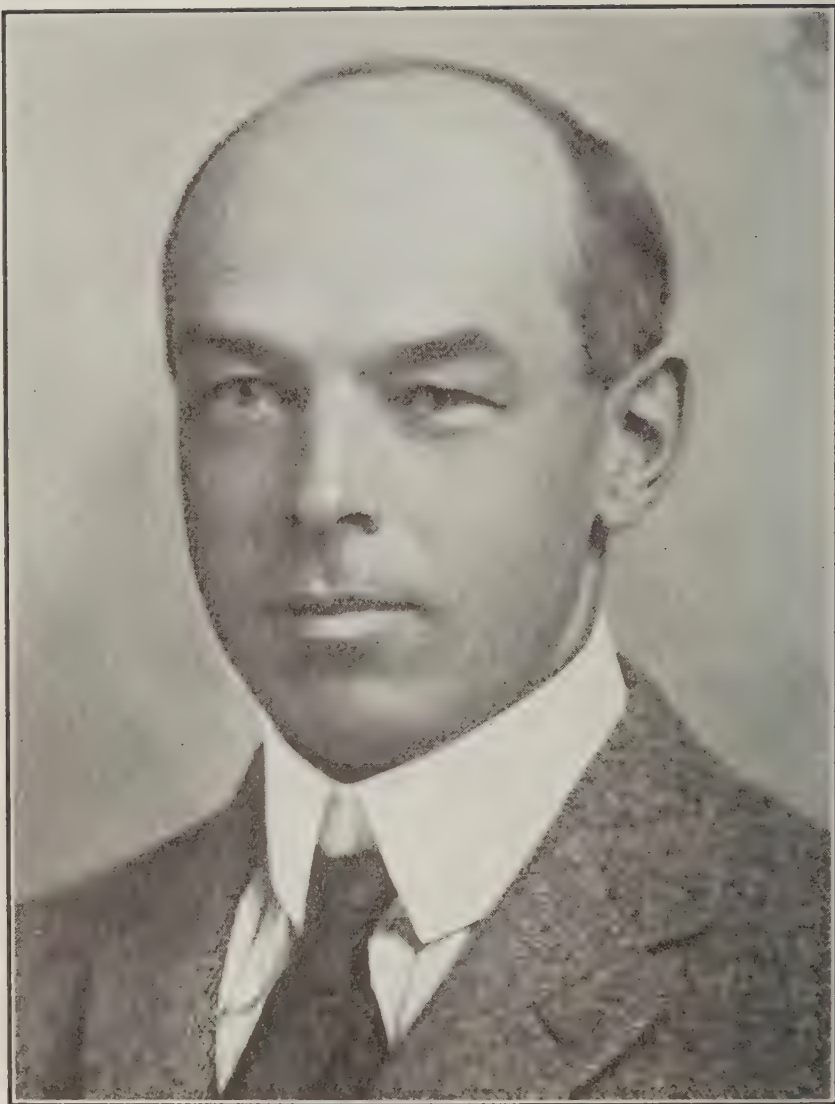
"As a school boy, John was very observant, and made the startling discovery that Canadian children are born without teeth. He straightway resolved to enter the dental profession with the hope of improving this sad condition, and graduated from the Dental Colleges of Toronto University and the University of Pennsylvania, when quite young, in fact, he graduated before he was of age.

"In addition to fishing, shooting, golfing and playing tennis, John also plays bridge. His bridge work is said to be very good. He is no gardener, but has a propensity for digging roots. He is also a reader, and some of his favourite works are: 'Four Out of Every Five,' 'Removing a Tartar,' 'The Story of the Film,' 'The Falseness of the Upper Ten,' 'Pushing Back the Danger Line,' and 'Many Extracts and Fragments.'

"The family crest consists of a drill rampant on a field of molars, supported by a stick of candy. The motto reads 'Impetum Magnum Faciamus' or 'Let Us Make a Great Charge.'

"Dr. Clay is interested in most things that tend to improve the life of the community, and there are two girls and one boy who think that he is one fine daddy."

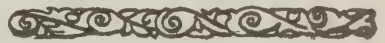
“ **A**S our dreams are, so are we;
Our dreams are but the mirror of ourselves. . . .
We shape in thought what soon we dress in deeds,
And, what we daily do within the heart,
We grow to be;
Our visions are ourselves.”



J. H. HOLBROOK, M.D.
Superintendent, Mountain Sanatorium, Hamilton, Ont.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE OUNCE OF
PREVENTION AS WELL AS THE POUND OF CURE



Vol. 17

TORONTO, JUNE, 1927

No. 6

Retention in Operative Dentistry

HUGH A. ROSS, D.D.S. *

Associate, Operative Dentistry, Faculty of Dentistry, University of Toronto.



RETENTION is a very important step in cavity preparation. Many fillings fail because the retention form has not been suitable to the requirements of the case. There may be some excuse for failure of a filling due to recurrent caries, as there are doubtless some factors in the etiology of dental caries over which the operator has very little or no control; but the problem of retention is purely a mechanical one, and since we have so many devices for retention of fillings at our disposal, there should be very little excuse for the failure of fillings due to faulty retention.

In this paper the writer proposes to classify the commonly used methods of securing retention, discover the secrets of their efficiency, and thus make available some information for their more intelligent use.

Methods of securing retention may be classified according to the force or mechanical principle employed, into:

Class I.—Those depending on friction between surfaces.

Class II.—Those depending on the interlocking of parts.

Class III.—Those depending on the adhesion of a cementing medium between surfaces.

For the purpose of this paper the writer proposes to refer to the retention secured by the above methods as:

Class I. or Frictional Retention.

Class II. or Interlocking Retention.

Class III. or Retention by Adhesion.

Seldom does the operator depend entirely on one class of retention for a given case, but rather on a combination of any two or all three

* The writer desires to acknowledge valuable assistance from Mr. P. G. Anderson in preparing the illustrations.

classes enumerated above. However, if we examine the retention form of a cavity, we shall see that the major part of the retention is secured by employing some one force or mechanical principle, but this may be supplemented by employing some secondary force or mechanical device to increase the retention to meet the requirements of the case. Thus in a given case the retentive form may be mainly of the Class I. variety, but additional retention of Class II. or Class III. variety may be used also. The operator should be able to analyze the retention form of any cavity, recognize the forces or principles employed, and know just what part each force or principle contributes to the successful retention of the restoration.

CLASS I. OR FRICTIONAL RETENTION.

In frictional retention the operator depends on the friction that would result from movement of the restoration over the walls of the cavity if the former were made to travel to exit over the walls of the latter. The value of the retention secured in this way will depend on:

- (a) Area of surfaces involved.
- (b) Pressure between surfaces.
- (c) Nature of surfaces.

Area.—Other things being equal, the frictional retention will vary as the area of the surfaces involved. The surfaces involved would be only those surfaces which would slide over each other if the restoration were travelling to exit, and the area would be the product of the depth of the cavity and the length of the cavo-surface angle presented to the direction of travel. (See Fig. 4, A and B.)

Pressure.—Other things being equal, the frictional retention will vary directly as the pressure between the surfaces. Such pressure may be due to any of the following factors, or to combinations of two or more factors acting together:

- (a) Close adaptation of restoration to tooth structure. The walls of the two parts should be so arranged that the restoration can be guided to exit without serious loss of contact with the adjacent tooth structure. In order that there be a minimum loss of contact, the walls of the preparation should be as nearly parallel as possible, and they should be arranged, if possible, to have confining value. The idea of parallel and enclosing walls has given rise to the expressions box-like cavity and box-like restoration.
- (b) Resiliency of tooth structure. This plays an important part in the retention of foil fillings, and indeed in case of any filling that is packed very tightly into a cavity. The opposing walls of dentine maintain a positive pressure upon the restoration and frictional retention is thus increased.

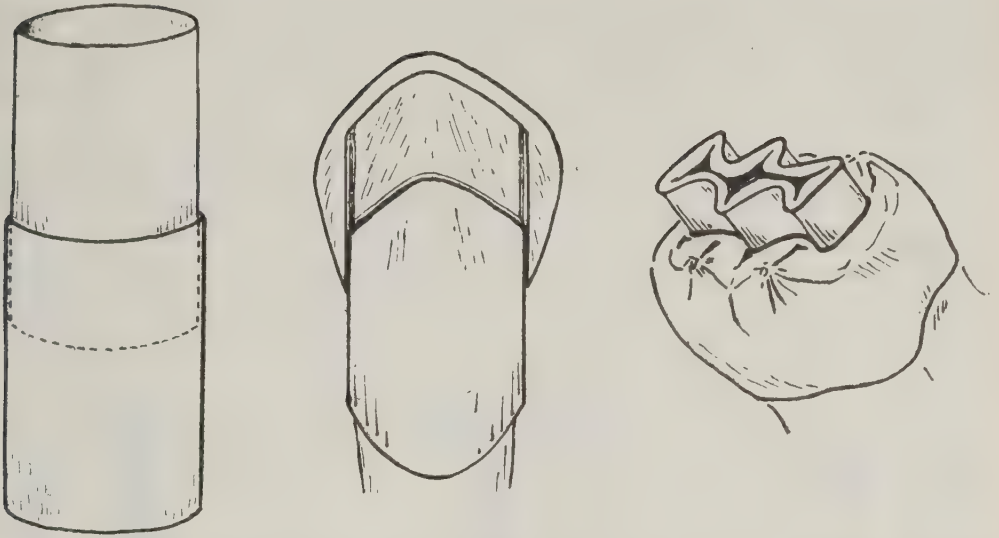


Fig. 1.—Showing intimacy of contact between restoration and walls of preparation when former is partly withdrawn from latter. Retention good.

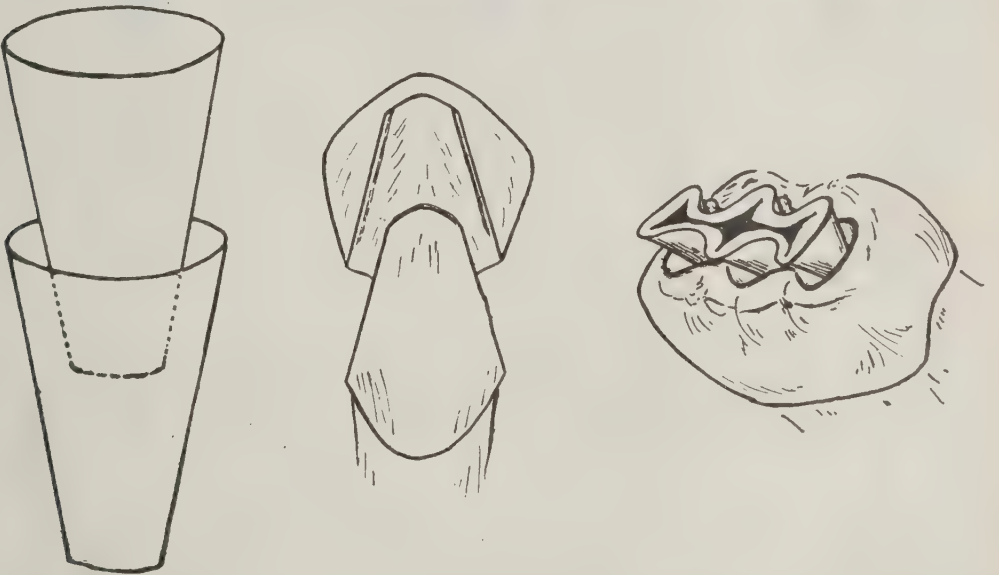


Fig. 2.—Showing loss of contact between restoration and walls of preparation when former is partly withdrawn from latter. Retention much less than in Fig. 1.

(c) Interlocking devices. The walls of a restoration may be held in very intimate contact with the walls of a cavity which has little or no confining value, by means of a supplementary interlocking device placed in another part of the tooth. Thus in a proximo-occlusal inlay the proximal part of the inlay may be held under pressure in contact with the adjacent cavity walls by means of a dovetail on the occlusal surface. (See Fig. 8.)

(d) Springy nature of the alloys from which some box-like restorations are made. It is possible to temper the various hard golds on the

market so that restorations cast from them and having suitable shapes can be made to exert constant positive pressure on the tooth structure with which they come in contact. This adds greatly to the frictional retention secured.

- (e) Intervening layer of cement acting as a key. Quite apart from any adhesive properties which a thin layer of cement may have, it serves the purpose of increasing the intimacy of contact and consequently the pressure between the surfaces involved, namely, surface of restoration, surfaces of thin layer of cement and surface of tooth structure.

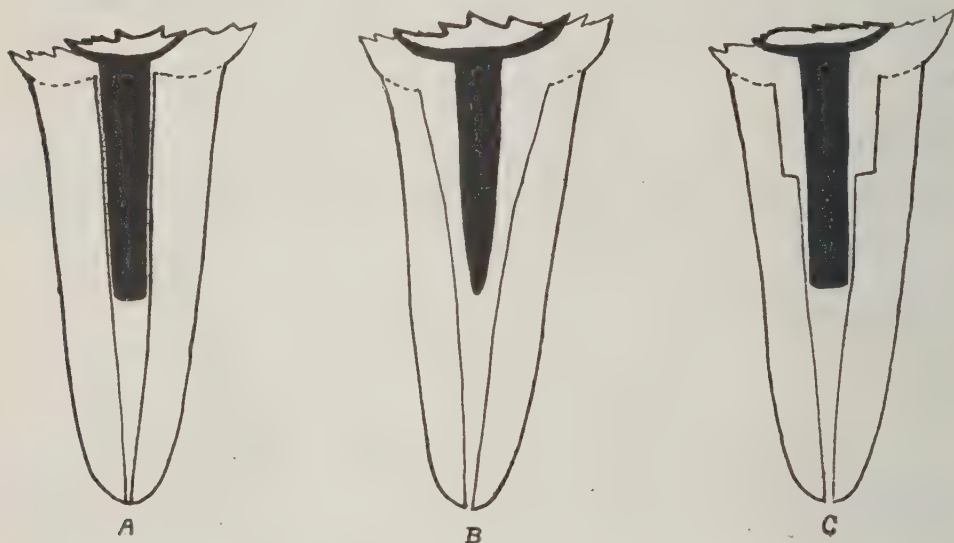


Fig. 3.—A, Showing layer of cement to maintain pressure between walls of post and walls of cavity. B, Walls of canal and post divergent. Frictional retention less than in A. C, Showing method of securing parallel walls and thus increasing retention. Weakening of coronal portion of root may be avoided by cutting steps on labial and lingual only.

Nature of Surfaces—As friction is said to be due to the interlocking of the minute elevations on touching surfaces, it follows that etching of the cavity side of a gold inlay or the roughening of the deeper portions of the walls of a cavity would serve to increase the amount of frictional retention between restoration and tooth.

PRACTICAL CONSIDERATIONS.

Frictional retention is depended on to a great extent in those cavities known as box-like cavities, e.g.:

- (a) Pit and Fissure cavities.
- (b) Gingival cavities which involve one surface only.
- (c) Supplementary cavities made to receive pins, posts, dowels, dovetails, etc. (Note: pins, posts, dowels and dovetails may also be used as interlocking devices.)
- (d) Proximal cavities in anterior teeth where incisal angles are not involved.

Friction is also an important consideration in making the retentive form of semi-box-like cavities such as the proximal parts of proximo-occlusal cavities. It is also the main retentive force depended upon in preparations made to receive box-like restorations such as M-O-D inlays, crow-foot inlays, full crowns, (gold shell or porcelain jacket,) three-quarter crowns, and many other modern bridge abutment pieces.

Pit and Fissure Cavities—The simple pit cavity made with a parallel-sided drill or bur is an excellent example of a box-like cavity (pill box type). Here the cavity walls are very nearly, if not exactly, parallel, and as the outline is confined to one surface, the cavity has therefore great confining value. In such cavities, frictional retention is so great that undercutting need not be used. Fissure cavities are very similar to pit cavities excepting that the area included by the outline is usually of an irregular shape. Their confining value is great, especially if the width of the cavity at any one point does not exceed one to two millimetres.

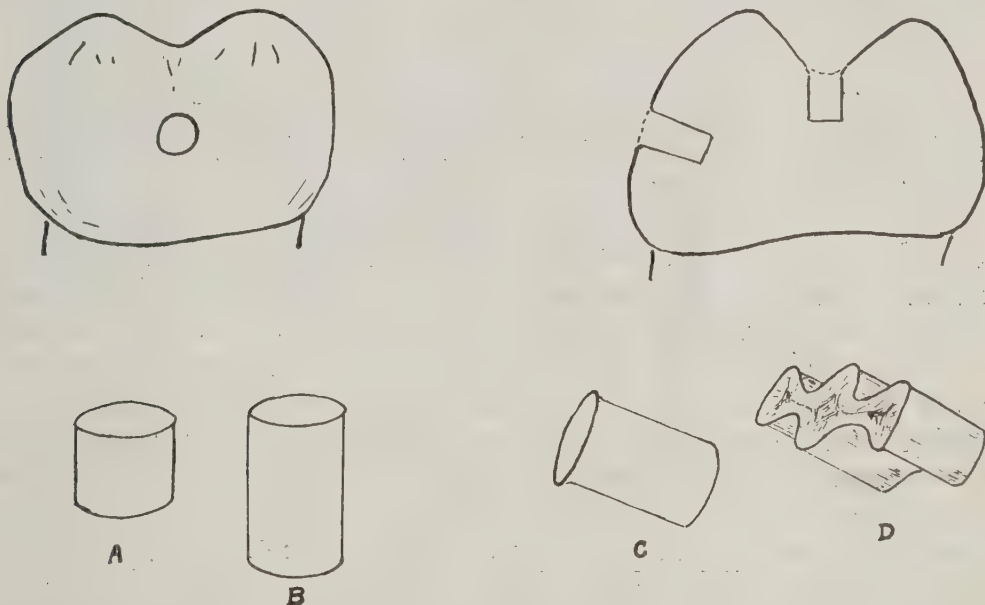


Fig. 4.—A, Restoration for typical pit cavity. If walls of cavity are nearly parallel, no undercutting is necessary. B, Showing that increased depth results in increased area of contact, and hence in greater retention, area exposed to dislodging forces remaining the same as in A. C and D, Showing similarity between pit and fissure cavities.

Gingival Cavities—The retentive form of this type of cavity is very similar to that of the pit or fissure cavity. They are sometimes called four-walled cavities, the walls being named gingival, occlusal, mesial and distal. In large gingival cavities and in large fissure cavities the area included by the outline will determine the depth of the cavity and whether additional retention of another class is to be used, for this area corresponds to the area of the surface of the filling exposed to the dislodging forces. Where the area of the exposed surface is great, it would be better practice to supplement frictional retention with under-

cutting (Class II retention) rather than to increase the depth of the cavity in order to increase the area of contact of filling with tooth structure and in so doing endanger the pulp.

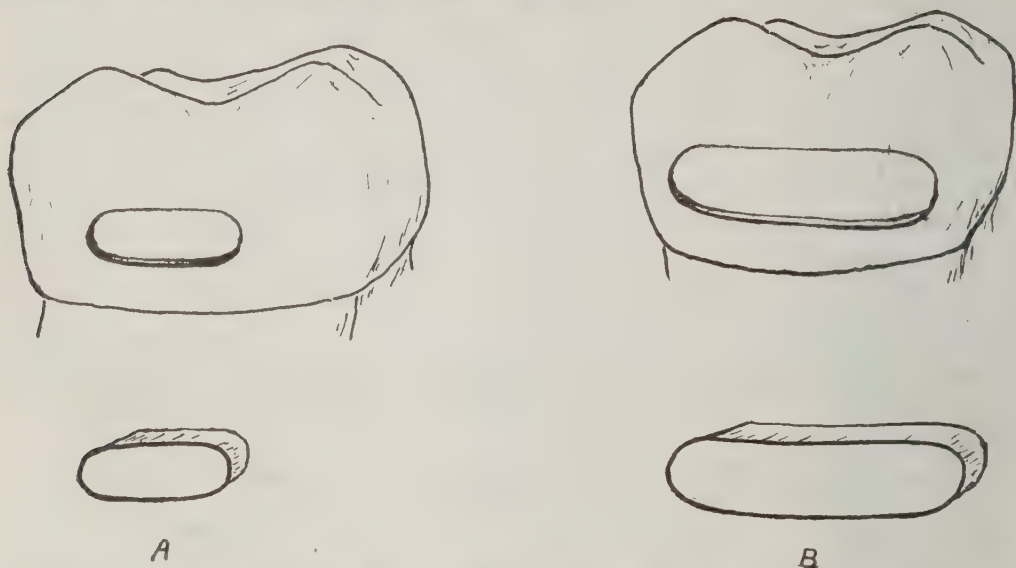


Fig. 5.—A, Restoration for typical gingival cavity. B, Area exposed to dislodging forces much greater than in A. Undercutting indicated to supplement frictional retention.

Supplementary Cavities—When it is difficult or impossible to secure good retentive form in the cavity or preparation itself, it becomes necessary to make supplementary cavities in sound tooth structure adjacent to the cavity to receive pins, posts, or the like. When used for the frictional retention developed, i.e., to resist withdrawal in a direction opposite to that of insertion, such pins, posts or dovetails are nothing more than miniature restorations in miniature box-like cavities. Their efficiency will therefore depend on the care exercised in preparing the miniature cavities and in fitting the restorations to them,—walls of cavity must be parallel and the diameter of the pin, post, or the like, be about the same as that of the cavity. In many cases it is possible to secure enough frictional retention in these small supplementary cavities to supply all the retention needed for large restorations. If one pin or post is to supply all the retention needed, it should be at least as long as the restoration itself, and should be made from some strong, rigid material, as platinized gold, so that the retaining force can be transferred from the anchorage of the pin to the restoration which has to resist the dislodging force. Instead of one pin, two or more short pins may be used. This is ideal for vital teeth where small pins may be inserted in the dentine in locations where the pulps will not be endangered. In a non-vital tooth, the root canal provides a suitable place in which to insert a large pin or post. In the case of a dowel crown without band, attached to a flat-ended root without shoulder, we have an excellent example of a restoration being

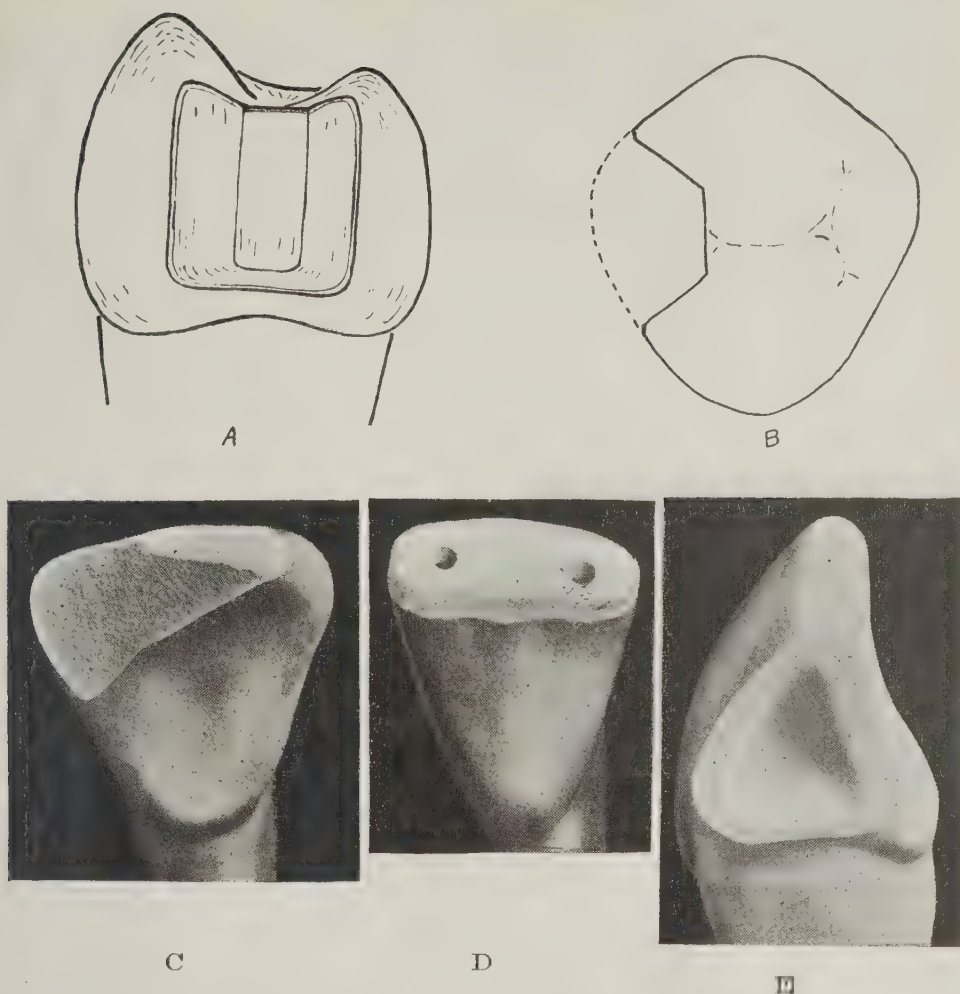


Fig. 6.—Examples of cases where retention must be secured by making supplementary cavities in adjacent tooth structure.

held in place solely by the frictional retention between walls of supplementary cavity (in this case the root canal) and post.

Pins and posts may be used in various ways: (a) attached to the restoration, e.g., gold inlay cast around a pin or post of different material, or pin and inlay cast from one material; (b) cemented or screwed into dentine and the restorations, plastic or cast, built to fit around them; (c) pin or post, restoration and supplementary cavity prepared separately and assembled at time of setting, in which case the pin or post is in reality a dowel. Closely related to pins and posts are the lugs and extensions frequently used in gingival seats and other locations. These, however, function chiefly as interlocking devices, and as their walls may not be parallel little frictional retention would be developed.

Although the name dovetail suggests that this is an interlocking device, yet it is valuable also for the frictional retention it gives to a restoration. If the walls of a cavity made to receive the

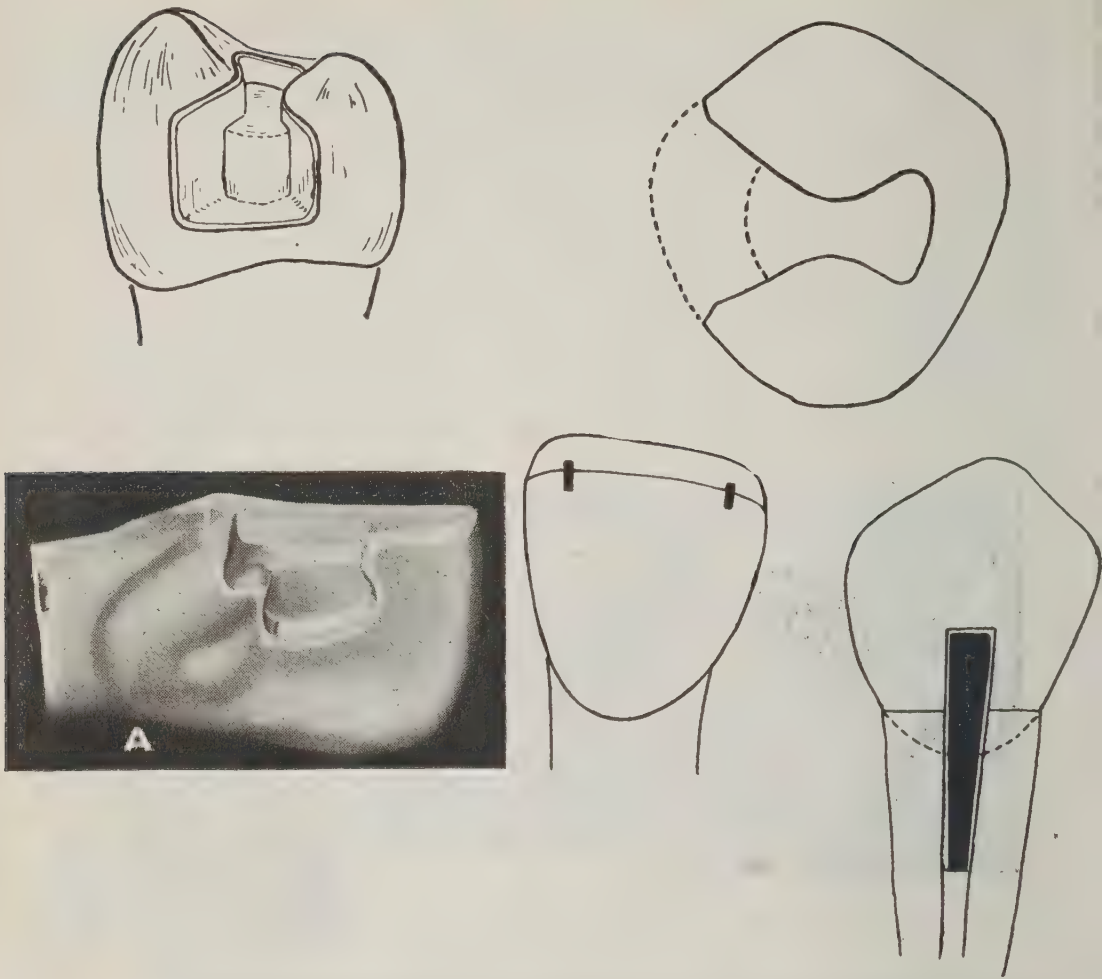


Fig. 7.—Showing supplementary cavities made in adjacent tooth structure.

dovetail portion of a filling are made parallel in the direction of insertion, and the restoration made to fit perfectly, there will be frictional resistance to dislodgment in a direction opposite to that of insertion. This is quite apart from the resistance offered to dislodgment in other directions. As dovetail cavities are relatively shallow, it is very important that the walls meet the floor of the cavity in a sharply defined line, and also that in the making of inlays the wax pattern or matrix be forced well into the basal line angles. Otherwise there would be serious loss of the frictional force sought after.

Proximal Cavities in Anterior Teeth—The Class III cavity should be shaped so as to have as much confining value as possible. Wherever possible, opposing parallel walls should be established to give frictional retention so that small undercuts in the point angles need not be depended upon entirely to provide the retention.

Semi-box-like Cavities—In this type of cavity, of which the proximal part of a proximo-occlusal cavity is a good example, one or more walls are missing, and the walls present may be so divergent with regard to

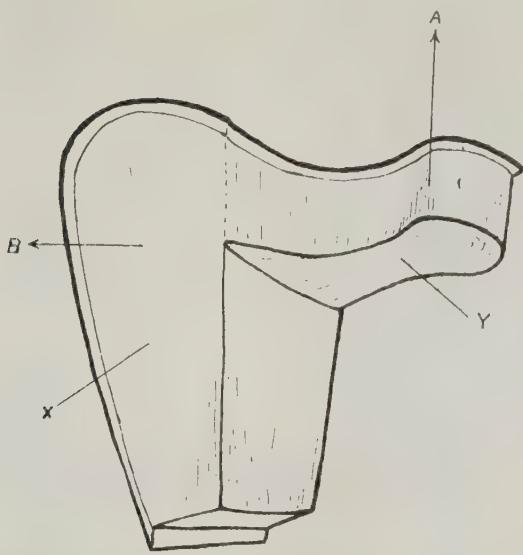


Fig. 8.—Typical proximo occlusal restoration for Class II. cavity. Parallel walls of dovetail portion Y responsible for resistance to dislodgment toward A. because of the frictional retention developed. Dislodgment toward B prevented by interlocking of dovetail portion Y with tooth structure.

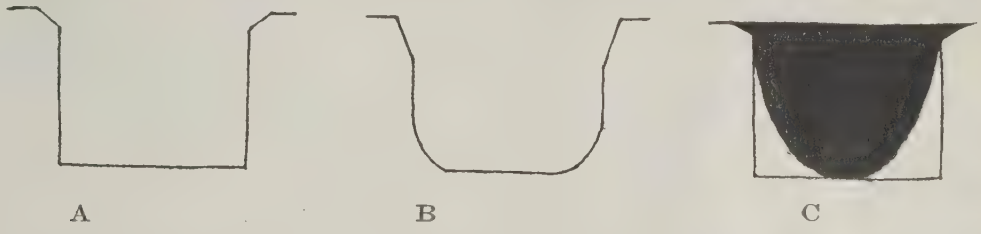
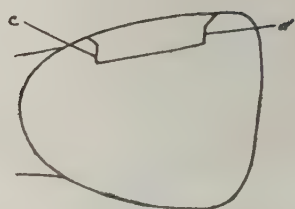
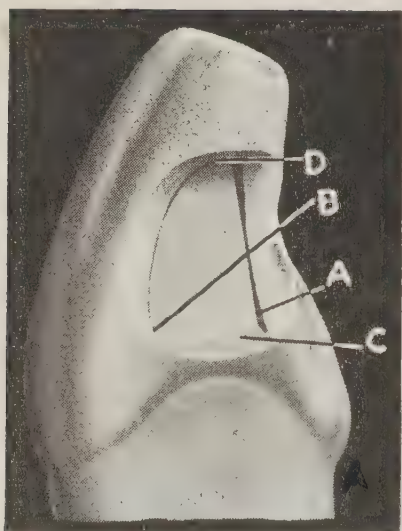


Fig. 9.—A, Cross section of supplementary cavity on lingual of upper central. Note the parallel walls, the well-defined angles and the shallow bevel. B, Example of ill-formed cavity. Note how the deep bevel and the ill-defined basal line angles have so shortened the parallel walls that little frictional retention would be developed. C, Wax pattern not forced into the internal line angles. Much of the desired frictional retention is lost.

each other that the cavity has very little confining value. (See Fig. 6, A.) In such cases the pressure between the restoration and the tooth structure would be so slight that there would be little frictional retention. However, this pressure can be increased by using some interlocking device to maintain the filling in very intimate contact with the tooth structure. (See Figs. 15 and 17 for suggestions.) If this be done, the frictional retention between restoration and tooth in the proximal part of the cavity will be a big factor in the retention of the whole filling.

Box-like Restorations—The same mechanical principles underlie the construction of such restorations as hold for box-like cavities; walls should be nearly parallel, area of contact great as is possible or expedient, and walls arranged to confine the tooth structure. The simplest example of this type of restoration is the gold shell crown. The retentive value of such a restoration is well known to every operator. In the case of three-quarter crowns and the modern anterior abutment



B

C

Fig. 10.—A, Class III. cavity in upper central for foil with bevelling, convenience angles and undercutting form of retention omitted. Note the lingual wall at (A) parallel (from axial wall outward) to a corresponding opposite labial wall at (B), and also the gingival wall at (C) parallel to the incisal line angle at (D). Labial wall at (B) and incisal line angles at (D) are not shown in photograph. B, Cross section through gingival portion of cavity from labial to lingual. C, Longitudinal section through mesiodistal plane.

pieces, there is usually so much loss of confining value, and hence of frictional retention, due to omission of labial walls of metal, that it becomes necessary to resort to the use of lingual bands, pins, grooves, bevelled margins or the like, to compensate for the loss.

CLASS II OR INTERLOCKING RETENTION.

In interlocking retention the operator depends on the mechanical interlocking of the tooth structure and the material from which the restoration is made. In the case of filling materials that are inserted in the plastic form and allowed to harden, the interlocking may be potential for all directions of dislodgment, while in the case of restorations inserted *en masse* the interlocking may be effective for only one direction of dislodgment; to prevent dislodgment in other directions the operator has to depend on Class I or Class III Retention. The attention of the reader is again drawn to the fact that some retaining devices provide retention of more than one class, e.g.: a properly constructed dovetail may provide interlocking retention against one dislodging force and frictional retention against some other dislodging force.

The efficiency of an interlocking device will depend on two factors: (a) strength of the interlocking parts, and (b) attachment of the interlocking parts to their respective parent bodies.

Strength of parts—The parts involved are the part of the tooth structure and the part of the restoration that engage with each other.

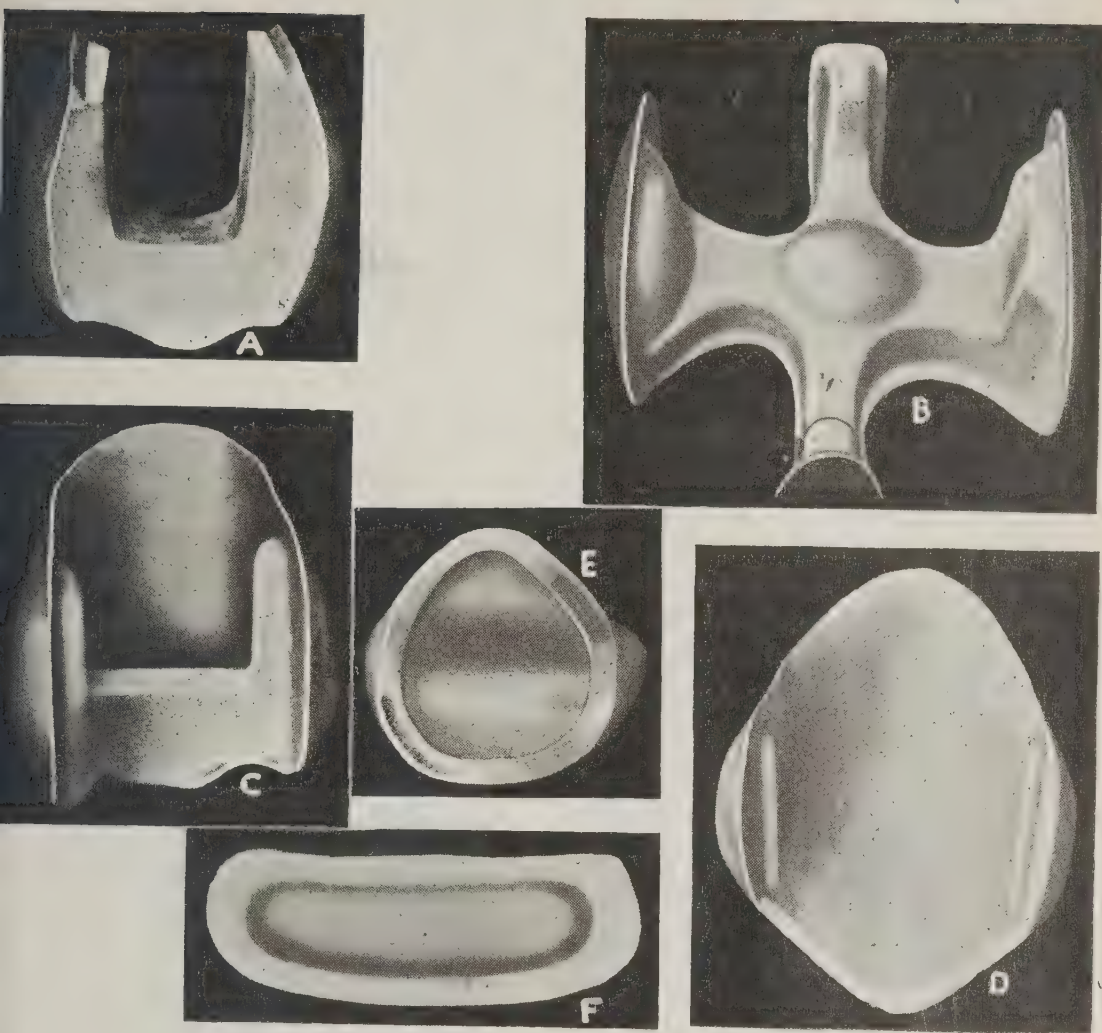


Fig. 11.—Examples of box-like restorations. A, Two walled restoration. B, Crowfoot inlay with four walls (part). C and D, Three walled abutment pieces. E and F, Porcelain restorations with four walls (complete and joined). Note the parallel arrangement of walls, confining value and the compensation in C and D for missing walls.

In every case the interlocking part of the tooth should be good sound tooth structure—preferably dentine. Frail enamel walls, decalcified structure, undermined triangular ridges or weakened cusps, should not be used as anchorages. The strength of the interlocking part of the restoration will depend upon its size and the kind of material from which the restoration is made,—taken for granted, of course, that the most approved methods of manipulating the material are used. The size of the interlocking part should vary in proportion to the size of the restoration itself and to the magnitude of the dislodging force. Sometimes it is possible to make the interlocking part of a stronger material than that used for the main restoration.

Attachment of parts to parent body—In the case of both tooth structure and restoration, the interlocking part of each should be an

integral part of the parent body or joined to it by a strong connecting link. In the case of the restoration, reinforcing wires may be imbedded in plastic filling materials at time of insertion to bind the parts of the restoration into one strong integral whole.

PRACTICAL CONSIDERATIONS.

The dental operator may use the mechanical principle of interlocking in a variety of ways and places. The following are some of the most commonly used interlocking devices:

I. Undercuts—

1. The whole cavity may be undercut from base to cavo-surface angle. This type of cavity is possible when preparing pit cavities in certain locations on the occlusal surfaces of molars and bicuspid where enamel rods converge from dentine to outer surface of tooth. In such a cavity, if the walls are made to coincide with the direction of the rods, the mouth of the cavity will be smaller than the base. Of course, only the plastic filling materials can be used to fill such cavities, but when these filling materials set, the restorations are firmly locked in the tooth for all directions of dislodgment.

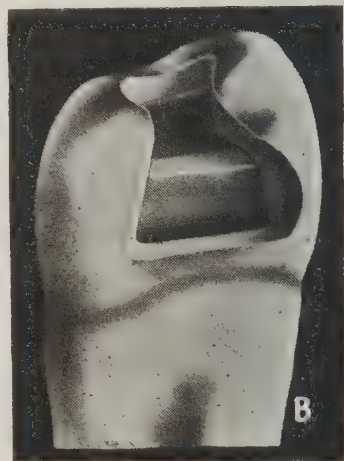
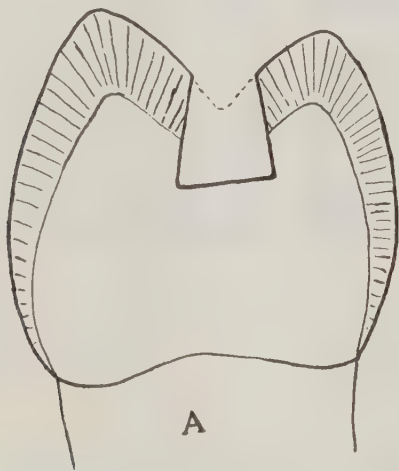


Fig. 12.—A, Showing cavity undercut from base to cavo surface angle. B, Application of this principle to a Class II. cavity in bicuspid.

2. The undercutting may be confined to the deeper parts of the cavity, while the main walls may diverge towards the outer enamel surface. Used in this way, the following rules should be observed:

- (a) The undercuts should be in the greatest body of dentine.
- (b) Should be in opposite walls, to be most efficient.
- (c) Should be away from the pulp.
- (d) Should be proportionate to the size of the restoration to be retained and to the strength of the filling material used.

(e) That part of the restoration filling the undercut should be an integral part of the restoration and not merely an extension connected to it by a small neck of material. Note the frequent failure of gold foils in anterior teeth due to fracture of the parts filling the undercuts in the gingival point angles from the main fillings.

This type of undercutting is obviously used in cavities for plastic filling materials only.

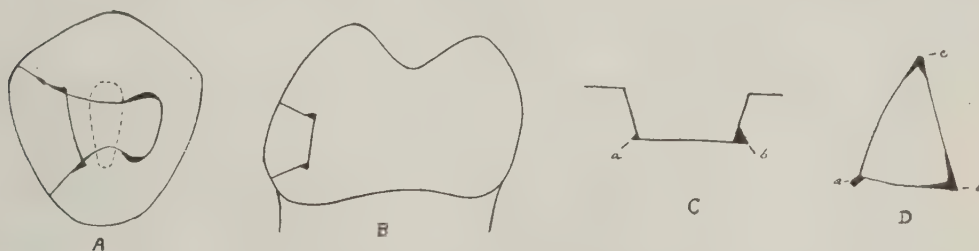


Fig. 13.—A, Showing undercuts in opposite walls and in locations away from pulp horns and marginal ridges. B, Undercuts in occlusal and gingival walls. C, Showing undercut at (a), too small for size of restoration. D, Section of foil filling Class III, close to axial wall. Shaded portions, the parts filling the undercuts. Note that (a) is not an integral part of filling, while (b) and (c) are well connected to the main body of the filling.

3. In the case of restorations inserted *en masse*, corresponding undercuts may be made in both restoration and cavity wall and these allowed to fill up with a key of cement at time of setting. In this way Frictional Retention may be supplemented with Interlocking Retention, in case of gold and porcelain inlays, posts and dowels for root canals, or even small intra-dental pins.

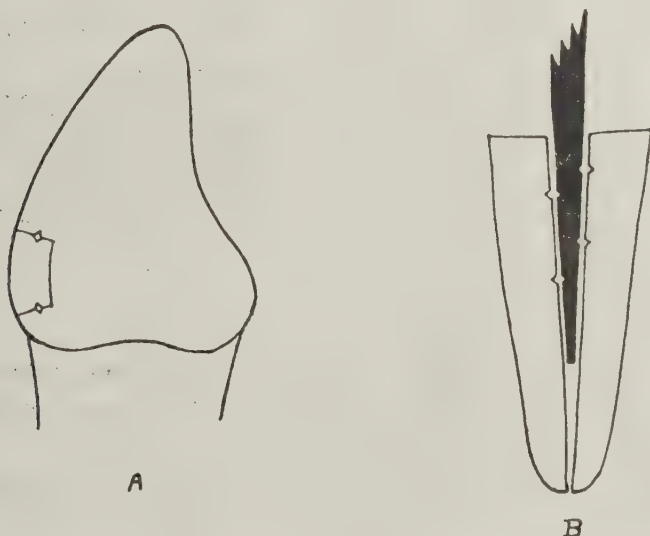


Fig. 14.—Showing use of undercuts in corresponding walls of cavity and restoration.

II. Dovetails—

A dovetail, as its name suggests, is a projection of somewhat trape-

zoidal outline which fits into a recess of corresponding shape. Usually the projection is part of the restoration and the recess is made in the tooth, but the reverse of this may be true, or one restoration may be dovetailed into another. The projection consists of a head and neck, the latter serving as the means of attachment to the main body of the restoration. The recess consists of a receptacle to receive the head and an entrance to receive the neck of the projection, both to be made in strong sound tooth structure—the anchorage. When making dovetails the following suggestions may serve as guides:

- (a) Head must be larger than neck.
- (b) Neck must serve to make the head an integral part of the whole restoration. The size of the neck must therefore depend on the physical properties of the filling material used and the magnitude and direction of the forces tending to dislodge the restoration.
- (c) The anchorage must be sound tooth structure, not liable to fracture from the rest of the tooth.

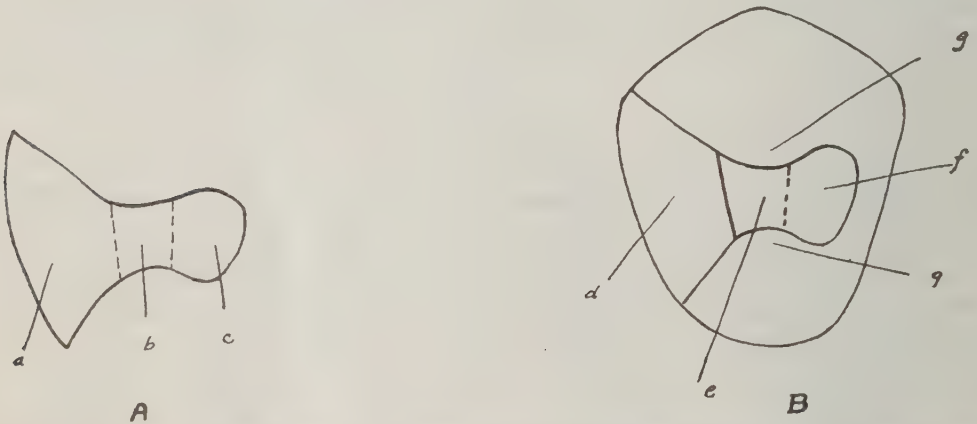


Fig. 15.—A, Occlusal view of proximo-occlusal restoration. (a) Main part; (b) neck; (c) dovetail. B, Occlusal view of cavity. (d) Proximal part; (e) entrance; (f) receptacle; (gg) the tooth structure which forms the anchorage for the restoration.

- (d) If neck is sufficiently strong and the anchorage good, there is no particular advantage in making the size of the receptacle much greater than that of the neck. Large receptacles tend to weaken the tooth structure and do not make the interlocking any more effective. Note, however, that if the frictional retention is to be depended upon to prevent dislodgment in some other direction, then increased size of receptacle may be desirable.
- (e) All other factors considered, a dovetail should be placed as far as possible from the fulcrum around which a filling would likely rotate in being dislodged.
- (f) The conventional trapezoidal outline form of most dovetails may be varied to suit the requirements of the case. Whatever be the shape of the head of the projection, it must not be able to pass

through the entrance to the receptacle. This effect may also be produced by deepening that part of the receptacle remote from the cavity proper, or by drilling a small hole to receive a pin attached to the filling. (See Fig. 17.)

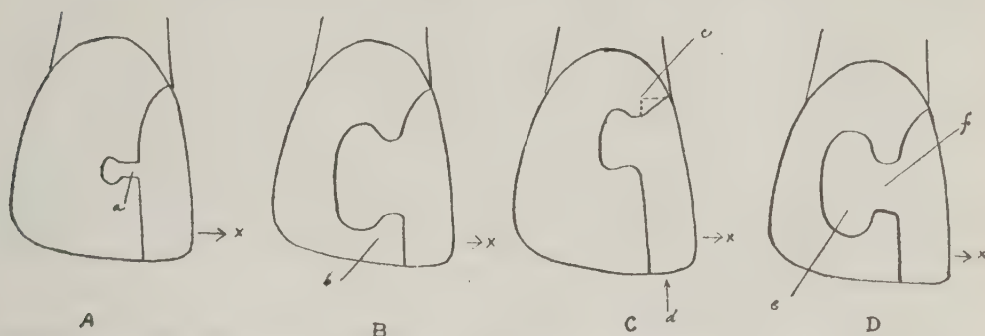


Fig. 16.—Errors in form of lingual dovetail in anterior teeth for gold inlay. With the exception of C each dovetail portion would be efficient in preventing dislodging towards X. A, Dovetail part is so small that inlay may bend at (a) and allow incisal portion to travel labially or slight blow on labial may dislodge inlay to lingual on account of the small amount of Frictional Retention between walls of receptacle and head. B, Dovetail portion too large. Anchorage at (b) likely to break away. C, Dovetail too near fulcrum (c) to resist dislodging forces applied in direction (d). D, Receptacle unnecessarily larger than entrance (f).

Dovetails are commonly used in proximo-occlusal cavities in molars and bicusps and in proximal cavities of anterior teeth, to prevent dislodgment towards the proximal. The reader must bear in mind, however, that these same dovetails, if constructed with parallel walls, supply much frictional retention to resist dislodgment towards occlusal and lingual respectively. (See Fig. 8.) In proximo-incisal (Class IV) cavities, a pin inserted near the nextremity of the incisal step is frequently used to prevent displacement towards the proximal.

III. Gingival pins, lugs, grooves—

In the case of proximo-occlusal inlay used for bridge abutment, there is often so much strain on the gingival part of the inlay that it is necessary to provide for some form of interlocking at this point. This can be done in one of the following ways:

- Drill a pin hole in gingival seat to receive a pin attached to the inlay.
- Make a depression or shallow well in a wide gingival seat to receive a lug or extension of the inlay made to fit.
- Make the axio-gingival line angle acute and make inlay to fit well down into the acute angle thus formed.

Such gingival interlocking devices are desirable in any inlay to ensure close adaptation at the gingival when the inlay is being set.

IV. Secondary pins, screws, inlays—

After an inlay has been set, it may be locked in position by one of the following methods:

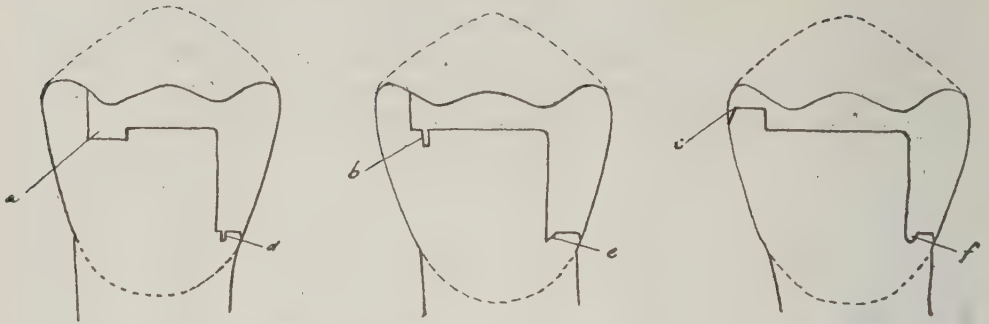


Fig. 17.—Suggestions for interlocking retention on occlusal and gingival. (a) Deepened portion of occlusal cavity. (b) Pin. (c) Lap over marginal ridge. (d) Pin. (e) Groove along axio-gingival line angle. (f) Shallow depression to receive lug on inlay.

(a) A hole may be drilled through inlay into tooth structure to receive a pin. The hole should be made in a location where the pulp would not be endangered and in a direction different to that in which the inlay was inserted. This hole may be tapped and a small screw inserted. Pins or screws used in this way are effective in locking three-quarter crowns in place.

(b) A small hole or cavity may be prepared in one of the joints where there would be sliding friction if the inlay were displaced, and in this hole or cavity a pin or small inlay may be inserted.

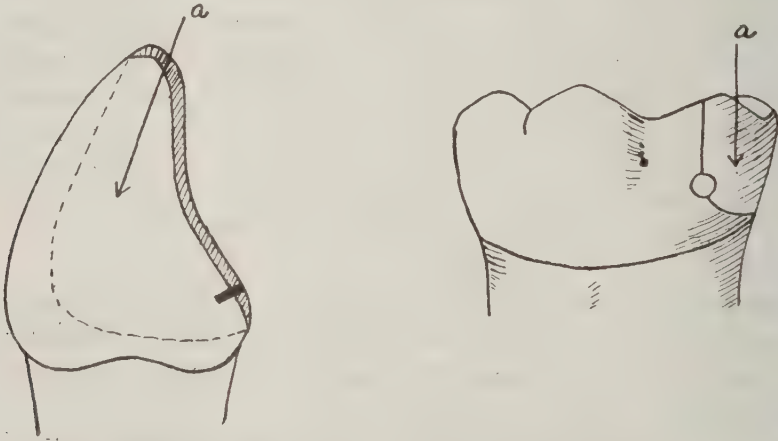


Fig. 18.—Showing secondary pin and inlay inserted after restorations have been cemented in position. Inlays inserted in direction (a). The secondary pin and inlay thus form interlocking devices.

V. Tongues and Grooves.—

Grooves are useful as interlocking devices on vital teeth without cavities. They are often used on the proximal surfaces of anterior teeth, and in the incisal edges of the same teeth where the thickness of tooth structure will permit when making three-quarter attachments. In these grooves fit corresponding tongues of metal forming part of the restoration. Used in this way, they serve as locking devices to prevent displacement of the restoration to the lingual.

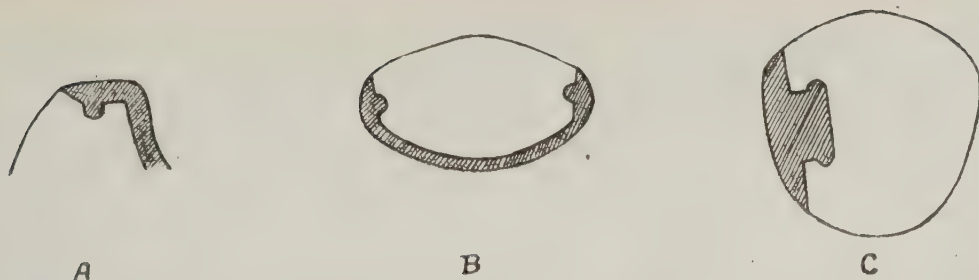


Fig. 19.—Showing the interlocking effect of grooves. A, Groove on thick incisal edge; B, grooves on mesial and distal of cuspid; C, grooves in buccal and lingual walls of Class II. cavity in lower second bicuspid.

VI. Laps made by bevelling.—

In a tooth where the incisal edge is too thin to accommodate a groove, the labial surface may be slightly bevelled and the restoration allowed to lap over on the labial. This will prevent displacement to the lingual, especially if the lap (and inlay) is made from one of the hard golds. Laps may be used as locking devices in other locations, e.g.: over the cutting edges of buccal cusps, over the proximo-labial line angles of anterior teeth or the proximo-buccal line angles of bicuspids and molars.



Fig. 20.—A, Longitudinal section and B, Cross section through incisal third of central. Note laps on the labial surfaces.

The reader's attention is here again drawn to the fact that many of the above interlocking devices can be made to have positive value as devices to supply frictional retention, e.g.: grooves and tongues on proximal sides of tooth and restoration respectively prevent displacement towards lingual, but the sliding friction developed as tongue slides in groove helps to prevent displacement towards occlusal.

CLASS III., OR RETENTION BY ADHESION.

In this type of retention the operator depends on the adhesion between the different surfaces involved when a cementing medium is interposed between tooth structure and restoration, or when the whole restoration is made of some plastic material having adhesive properties.

Adhesion is defined in text books on physics as the force which tends to cause the molecules on the surface of one object to cling or

adhere to the molecules on the surface of another object when such surfaces are brought into contact. The more intimate the contact of surfaces, the greater will be the adhesion. Hence polishing the surfaces of the two substances and conforming one surface to the other so accurately as to exclude air serves to increase the force of adhesion. Perhaps the best example of true adhesion is that existing between the surfaces of the steel gauge blocks made by Johansson, a Swedish scientist. These are "rectangular pieces of tool steel, hardened, ground and lapped. Their surfaces are absolutely flat and parallel . . . each surface being the nearest approach to the perfect theoretical plane ever produced by the hand of man. When rubbed across the palm of the hand and brought in contact with one another, two such blocks have stuck together with a force equivalent to thirty-three atmospheres."

In the industrial world and in dentistry adhesion, so-called, is more often secured by the use of a thin film of cementing medium between the parts involved. As these cementing media are sticky or adhesive when plastic and non-adhesive when dry or set, it is a debatable question whether the surfaces held together by such media are kept in contact by the force of adhesion or by interlocking retention. In dentistry the medium used is one of the dental cements. It is altogether likely that the efficiency of a dental cement in securing retention depends on the fact that when soft the cement penetrates into the pores of the surfaces involved and, when the cement sets or hardens, the surfaces are interlocked together by means of the strong layer of cement. That our dental cements have practically no adhesive properties when hard can be demonstrated by allowing a mix of cement to harden on a very highly polished glass slab. When dry it can be flaked off the smooth glass surface very easily. If there be any scratches or rough places on the surface, however, the cement does seem to adhere. This may explain why cement adheres so tenaciously to some enamel surfaces when a gold shell crown has been removed from a tooth.

If retention by adhesion in dentistry is largely, then, a modified form of interlocking retention, it follows that the best results will be obtained by observing the following rules:

1. Surfaces should not be too highly polished. Etching or roughening the surfaces involved to within one-half millimetre of the cavo-surface angle will increase the interlocking effect of the cement.
2. Cement powder must be very finely ground and mix must be rather on the thin side to permit of deep penetration.
3. Cement must harden into a very strong mass, that is, the cohesive properties of the particles of cement for each other must be very great. Laboratory tests have shown that cements of fine vitreous texture have the greatest crushing strength on setting.

4. Surfaces must be free from moisture, oil, or anything that would interfere with the setting of the cement or with the penetration.

PRACTICAL CONSIDERATIONS.

Except in rare cases, retention by adhesion should not be depended upon as the sole means of retaining a restoration in position. In case of some deciduous teeth, and in doing temporary operations on paining teeth for patients who are sick, nervous or aged, we may occasionally depend on the adhesive property of a good brand of cement for retention. Sometimes the cavity is cupped out with little or no undercutting or without even parallel walls, and when the operator finds it impossible to do any cutting with bur or excavator, he may be glad to trust to the adhesive property of cement for retention. The failure of the filling may occur in a month or two, but at a subsequent sitting it may be possible to obtain retention of another class. Retention by adhesion finds its greatest place in operative dentistry as a method of supplementing retention of either Class I. or Class II.

When planning the retention for a restoration, the operator should give careful consideration to the following:

1. The direction and magnitude of the dislodging forces. This will involve a close study of the occlusion, the masticatory movements, habits of mastication, development and strength of the masticatory muscles.
2. The manner in which restorations fail—the breaking point, the fulcrum around which the restoration rotates when it leaves the tooth.
3. The strength of the remaining tooth structure in which anchorage is to be secured.
4. The work which the restoration has to perform. A restoration which serves as an abutment for a bridge must be retained more firmly than one which serves to restore lost tooth structure only.

It is hardly possible to measure the retentive form of a cavity by any known unit of measurement, but the intelligent application of the underlying principles of retention, together with a growing experience in the work, will enable the thoughtful, observant operator to succeed where previous efforts were attended with failure.

TO REMOVE ROUGE.—After polishing crowns, bridges, plates, etc., I found it difficult to remove traces of rouge, and would spend much precious time fussing with a brush and soap and water trying to do so. Try a solution of bicarbonate of soda and hot water with a brush. It quickly and thoroughly removes all traces of rouge. Denatured alcohol will also work beautifully, but is more expensive.—*Dental Digest*.

Diseased Teeth of Children and Their Relation to Tuberculosis

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THE above question is one in which I am very greatly interested. My first definite impression on this problem was obtained from Dr. Price, of Cleveland, when he came to Hamilton in 1917 or 1918, showing moving pictures of the effect of the injection of streptococcus germs into the blood stream of frogs, and since that day, I have been gradually gathering impressions from the study of our patients which have convinced me that infected teeth are a factor in the lighting up of old healed tuberculosis in adults. Even before we had an x-ray equipment in our Institution, one case stands out very clearly in my mind, where one of our patients with a cavity at the right apex, showed no improvement for months. Finally, after hearing Dr. Price's views, we had him referred to a radiologist in the city who x-rayed his teeth and found a very definite abscess, following the removal of which this patient almost immediately began to improve and, better still, has remained well up to the present.

Our active study of this question began following the installation of the x-ray plant back in 1919, and we soon became so impressed with the importance of dental caries that we have since had a permanent man on our staff to carry out dental treatment for our patients. This includes chiefly extractions and prophylaxis, together with plate work for those who have had extensive extractions, and during this period we have gathered a large amount of material which has convinced us that infected teeth are a very definite factor in the production of adult pulmonary tuberculosis, and that the successful treatment of adult pulmonary tuberculosis is to a considerable extent dependent upon the removal of these foci of infection.

Taken over a long period of years, therefore, I think there can be no doubt about diseased teeth not only predisposing to tuberculosis but also standing in the way of the recovery of actual cases of tuberculous disease, and I am pleased to see in the last number of the *British Medical Journal*, the report of research work on the relation of streptococcus hemolyticus to the progress of pulmonary tuberculous disease. The conclusion arrived at in this study is to the effect that these germs have a definitely unfavourable influence on the progress of the disease, and I am of the opinion that further work on this problem will prove his claim to be correct.

In discussing a question of this sort, it is very necessary to view the question from the standpoint of one or two decades, rather than to look for immediate effects. In fact, I am not sure that diseased teeth have any

definite influence on the lighting up of tuberculosis in childhood. I am coming more and more to look upon the primary infection with tuberculosis as in the nature of an accident to the individual child, and we know that by the time twenty years of age has been reached, practically one-half of the human race has been infected as shown by positive tuberculin tests. If this first infection with tubercle bacilli is completely cleared up our patient is vaccinated, and through the process develops a definite degree of immunity which serves to a very considerable extent to protect him against future infections. If, on the other hand, due to gross infection or unsatisfactory living conditions, this primary infection goes on developing and eventually changes from tuberculous infection to tuberculous disease, then this patient is in line for probably a generalized infection in childhood or a localized pulmonary tuberculosis of adult years, and as seen above, infected teeth can play a part in the extension of the tuberculous disease of adult life.

I feel, though, that diseased teeth can serve not only directly, but indirectly as a factor in the development of tuberculous disease of the child, for it is a well-recognized fact that children with diseased teeth and other mouth infections show a very considerable degree of under-nourishment and there can be no doubt that these under-nourished children will show less resistance to a primary tuberculous infection than the children who are well nourished and well cared for. This, however, is probably a minor factor as compared with the relation to tuberculous disease in later life.

The difficulty of definitely proving these points is very great, and this is especially true in the childhood period, because tuberculous infection in that stage is a process of the lymphatic system rather than of localized pulmonary disease. The same applies also to the non-tuberculous infection from diseased teeth of children, this type of infection probably also extending through the lymphatic system, the disease eventually reaching the bronchial or mediastinal glands. Clinically, it is impossible to distinguish the tuberculous type of infection of mediastinal glands from the non-tuberculous type, and the same applies also to the x-ray picture. The only definite way of distinguishing is by post-mortem investigation, and these cases do not come to post-mortem.

Not so long ago we were interested in the study of a case, aged twenty-four, which eventually developed miliary tuberculosis, but which at the outset was apparently lighted up by infected teeth. The patient had been to the dentist for treatment, and following the second visit to the dentist, developed a severe chill on the journey home. Following this attack he developed a certain amount of pleurisy which gradually cleared up. The boy went to work too soon, and again pleurisy pains and temperature developed. This time, he immediately had the diseased teeth extracted, but instead of the lung condition clearing up, it continued to progress, and eventually x-ray examination showed a diffuse miliary infection of both lungs. This is one of three or four cases which,

in my experience, have had acute tuberculous infection following extraction of teeth, and I cannot understand why this should have any effect on the tuberculous condition unless the non-tuberculous germs in the foci of infection, connected with the abscessed teeth, lead to the extension of an associated tuberculous infection. If this explanation is correct then, every tooth that is allowed to go on to abscess formation is a potential factor in reducing the life expectancy of the individual, and in the case of individuals who become infected with tuberculosis, it becomes even a more serious factor than in the non-tuberculous cases.

My feeling in the matter is that no case of active tuberculosis of adults should take the risk of retaining dead teeth because of the well-known tendency of these teeth to become foci of infection. If, on the other hand, people who have no tuberculosis, wish to take the chances associated with dead teeth, they should remember that these are danger points and should have them frequently investigated by the combination of examination by a capable dental expert and by the x-ray.

If you will agree with me thus far, I feel very sure that you will agree that the proper way of handling this whole problem is from the standpoint of prevention. In other words, we should see to it that the teeth of children are so cared for that they will never require to have the nerve killed in order to save the tooth for the individual. It is little use for us to talk of this measure for the adults of to-day, for in our day dental work with children was conspicuous by its exception, and I would venture the prediction that more than fifty per cent. of the adults here to-day have lost one or more of their six-year molars. As a matter of fact, I had my first six-year molar extracted about a month ago, not because it was a dead tooth, but because my life had been made very uncomfortable for me due to rheumatism of an elbow and a shoulder, and after studying the situation, I was convinced that this tooth was the culprit, because of the very large filling that it had carried for many years. I am not yet absolutely sure that this view is correct, but hope springs eternal, and the pains are getting less severe.

I am convinced, therefore, that it is most important in the case of every child that dental treatment should be carried out early, first, so that the nerve should not need to be killed, and second, so that fillings of large proportion should not be necessary.

Those who have had to do with school medical inspection in the County of Wentworth have noted over and over again that children coming from schools where school medical inspection is in force have far healthier mouths than children from the schools not under medical inspection. In fact, in my own family, I have been very much helped by the checking up which my own children receive from the school nurse and I am a strong believer in the value of periodical inspections of school children, and for that matter, of adults as well. This is a procedure which it is useless to leave to the parents to-day, and even if school medical inspection went no farther than to have the children

looked over periodically by a well-trained nurse, and to have any defects discovered, reported to the parents, I would consider that school medical inspection is very much worth while. But I would go so far as to say that the general acceptance of a well-organized system of school medical inspection in which co-operation with the parents and the family physician is properly worked out is probably the greatest sociological advance of the last decade, but to understand its importance, we must realize that the benefits in most cases are not seen immediately, but are most applicable in the later decades of the life of the individual. There is no doubt in my mind that once we have a universal system of school medical inspection, we will have gone a long way to prevent not only a certain degree of tuberculosis, but also many of the other factors which carry off individuals in their fourth and fifth decade in life, whereas they should live to a ripe old age.

In conclusion, I do not want to claim too much for the relation of dental caries of childhood to the incidence of tuberculosis, but have no hesitation in saying that under present conditions, it is a definite factor, and that this factor can be almost entirely prevented through school medical and dental inspection.

Proceedings of the 1927 Meeting of the Dental Society of Western Canada

LESLIE MCINTYRE, D.D.S., EDMONTON.



THE newly-organized Dental Society of Western Canada held an exceedingly successful Convention in Edmonton, May 25th, 26th and 27th, 1927. The House of Delegates, ten men from each of the Provinces of Manitoba, Saskatchewan and Alberta, assembled the day preceding the Convention, and held a business session. The tentative Constitution, drawn up in Winnipeg in 1925, was submitted and discussed, clause by clause, and, with modifications, adopted.

The officers elected for the ensuing two years are: Dr. George Cameron, Swift Current, Saskatchewan, President; Dr. Harry M. Garvin, Winnipeg, First Vice-President; Dr. Leslie McIntyre, Edmonton, Second Vice-President; Dr. J. D. L. Fasken, Regina, General Secretary; Dr. Jas. Brimacombe, Weyburn, Treasurer.

On May 25th the Convention opened for its three days of work and pleasure, in the MacDonald Hotel. The attendance, over 165 in all, was very satisfactory, representative quotas from all points being present. President Dr. E. M. Doyle, of Calgary, opened the session by calling on the Alberta Minister of Health, Hon. Geo. Hoadley, who gave the address of welcome. His talk was indicative of the

fact that his Department is keenly alive to the important place good dentistry occupies in the health of the people.

Dr. Fred J. Conboy brought greetings and messages of good-will from The University of Toronto, The Ontario Department of Health, and Eastern Dental Associations. He gave two addresses on "The Building and Managing of a Dental Practice" before the Convention, spoke once to the Rotary Club and once to the Saskatchewan graduates, while here. He was able to render service to the members of the profession in a variety of ways, and was a very welcome part of the programme.

Dr. Fred Molt, of Chicago, gave a thoughtful discourse on "The Preparation of the Mouth for Dentures, with Removal of Foci of Infection," and an illustrated lecture on "X-ray Diagnosis." Dr. Molt's work was well received.

Dr. Robert Gillis, of Hammond, Ind., made a big hit, with his genial personality and splendid ability. He took part three times, going thoroughly into articulation and articulator evolution; stumbling blocks in denture construction; and terminated his series by checking up, criticizing, measuring, recording and regrounding a set of dentures already in use.

The Dental Society of the State of Washington very courteously returned the compliment of Alberta's clinician being sent to their meeting in 1925. Their State President, Dr. W. I. Ferrier, accompanied by Dr. E. Jones, of Burlington, Wash., put on a clinic on "Clamp Adjustment, Rubber Dam Manipulation and Insertion of Gold Foil." Dr. Ferrier preceded his practical work by a paper on indications for this class of work. The Doctor is recognized as a master craftsman in his line, and his missionary work should aid in the timely revival of what threatened to become a lost art.

Western Canadian clinicians, most of whom had never appeared before in clinics, put on a series of half-hour progressive demonstrations of which they can be very proud. Never again need they have hesitation in staging their own ability, for they can take their places anywhere. The following gives as varied a list of clinics as can be shown at such a gathering:

"Gold Foil Technique," Dr. W. I. Ferrier, Seattle, Dr. E. M. Jones, Burlington, Wash. "Impression Taking" full cases, Dr. L. V. Janes, Edmonton. "Impression Taking" partial cases, Dr. Jas. Carmichael, Edmonton. "Jackson's Orthodontia Appliances," Dr. Waldo Murray, Camrose. "Some Suggestions in Difficult Extractions and Local Anæsthesia," Dr. T. O. Forsythe, Winnipeg. "Harper's Amalgam Technique," Saskatoon Study Group. "Something Practical in Crown and Bridge Work," Dr. P. G. Atkinson, Calgary. "Analgesia in Preparing Gingival Cavities," Dr. J. W. Clay and Dr. J. M. Dixon, Calgary. "Porcelain Restorations," Dr. P. S. LaFleche, Winnipeg. "Rebasing Dentures," Dr. R. H. MacDougall,

Moose Jaw. "X-ray Diagnosis," Dr. C. H. Vroman, Winnipeg. "Porcelain Jacket Crowns," Dr. Ernest Kennedy, Banff. "Selected," Dr. W. A. Piper, Calgary. "Vincent's Infection" (Microscopic), Dr. M. H. Garvin, Winnipeg. "Office Records," Dr. Kenneth M. Johnson, Winnipeg. "Orthodontia Problems," Dr. Manly Bowles, Winnipeg. "Orthodontia half round Pin and Tube Appliance for Simple Cases," Dr. J. G. Pullar, Calgary. "Impressions" (Table Clinic), Dr. Harry Gilchrist, Edmonton. "Something New in Denture Construction," Dr. H. M. Landing, Edmonton. "Gold Inlay Technique," Dr. R. R. McIntyre, Calgary.

The lounge room connecting directly with the Palm Room was occupied by the exhibitors. As usual, they were given great attention, and new features were presented in a number of cases. The thanks of the Western dentists is due to these firms for coming such a distance to materially aid in the success of the meeting.

A noticeable feature of this meeting was the provision made for giving the visiting ladies a good time. The Entertainment Committee selected a group of ladies to assist, and under the able leadership of Mrs. Jas. Carmichael they made things move. Teas at both the Mayfair Golf Course and the Country Club, golf, drives, bridge parties and dances, comprised a most enjoyable programme for the ladies.

The last evening terminated in an informal banquet, followed by a dance. The Palm Room was packed. The clinicians spoke briefly and musical numbers were woven into the programme. During the evening our visitor, Mr. H. P. Temple, presented the golf trophies. The gold medallion presented by the Edmonton Dental Society to the one heading the score for the three Provinces went to Dr. P. G. Atkinson, of Calgary, while the Ash-Temple Cup with medal for Alberta championship was won by Dr. L. R. Dodds, of Edmonton.

The men in Edmonton are highly gratified with the success of the meeting. The attendance was splendid—just a little more than estimated, and from a financial point of view the Dental Society of Western Canada is well on its way. The purposes of the meeting, to bring out our own clinicians, to bring our men into closer contact, and to develop our Profession, were well accomplished. We wish the Regina men every success, and will endeavour to aid them in every way to make the 1929 meeting the best yet.

TO PREVENT TEETH SLIPPING FROM FORCEPS.—In extracting where there is danger of the tooth slipping through the forceps, instead of tying cotton rolls or other similar devices, heat a little beeswax and fill the beaks of the forceps from the joint up. When applying the forceps to the tooth, press the tooth right into the beeswax. It is sticky enough so that it will not fall out of the forceps, and also makes it impossible for the tooth to slip through.—*Dental Digest*.

Neuralgias of the Jaws*

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THE term neuralgia is often used in a somewhat loose sense. Strictly speaking it implies pain somewhere in the distribution of a nerve, and it may be merely one of the features of a clinical condition which it is used to designate. No doubt this is because the onset of pain in the course of any malady always hastens the appeal for professional assistance, so that the symptom is prominent in the minds of both patient and attendant; to dental surgeons this tendency must be specially familiar. But the popular doctrine that a disease requires attention only if it is painful is a dangerous generalisation—witness, for example, the number of women suffering from cancer of the breast who come to the surgeon too late for radical cure. However, the broader significance of the term appears to have been established in nomenclature by use and wont, and it will be convenient to employ it throughout this paper.

Pain may assume any one of a number of different forms, and it is often possible to correlate these with the differing physiological functions of the individual fibres of an anatomic nerve. Thus it may be “sharp” or “lancinating,” as if pain fibres were affected; “hot” or “burning,” as if thermal fibres were affected; or “full” or “bursting,” as if pressure fibres were affected. Further, it may be continuous, it may appear in paroxysms, or paroxysmal exacerbations may be superimposed upon continuous pain. Again, it may remain strictly localised to one spot, or it may radiate from the point of its greatest severity. There is, then, much to be learned by questioning a patient who complains of neuralgia, and while there is no disease, with the exception of fully developed major trigeminal neuralgia, in which the diagnosis can be made from the history alone, certain combinations of the characters I have mentioned may narrow the diagnostic field, and possibly direct attention to some special cause for the pain.

Pain in the upper or lower jaws implies, in the great majority of cases, some involvement of the fifth cranial nerve, and it is, therefore, germane to my subject to pass in brief review the more important points in its anatomy and physiology.

Anatomy.—The origin of the sensory branches of the fifth nerve, with which we are immediately concerned, is from the ganglion of Gasser, an intercranial structure lying in a pocket of dura mater on the apex of the petrous part of the temporal bone. This ganglion is the seat of the cells which preside over the first part of the sensory pathway

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between jaws and brain. From its anterior border arise three branches:

- (1) The *ophthalmic*, which supplies structures in and around the orbit, which is therefore outwith our subject.
- (2) The *maxillary*, which leaves the skull by the foramen rotundum, and ultimately supplies the upper jaw.
- (3) The *mandibular*, which leaves the skull by the foramen ovale, and ultimately supplies the lower jaw.

The third of these branches is joined outside the skull by the motor root of the nerve, of importance to dental surgeons because it supplies the muscles of mastication—the pterygoids, masseter and temporal.

Further, by way of the branches of the fifth nerve there pass to the periphery fibres from two other sources:—

- (1) Fibres, both incoming and outgoing, from the 7th or facial nerve.
- (2) Fibres derived from the sympathetic nerve plexus around the internal carotid artery concerned, among other functions, with the secretion of saliva, and with the control of the calibre of the blood vessels in that area. It is possible that these fibres may transmit certain types of sensation to the brain.

Physiology.—The task of the fifth nerve is an extensive and complicated one. It supplies the greater part of the face and the oral and nasal cavities with sensation, it regulates their blood supply, it activates mastication, and it provides a pathway for controlling the secretions which are poured into the mouth and nose. This complexity of distribution and of function is reflected in the fact that, at the points where each of the three main divisions is joined by the subsidiary fibres of which I have spoken, there is situated a nerve sub-station or ganglion, a provision which permits of their mingling and re-distribution. Two of these ganglia—the sphenopalatine or Meckel's ganglion on the maxillary branch, and the otic ganglion on the mandibular branch—have a decided bearing upon our subject, to which I shall return.

NEURALGIAS OF THE JAWS.

I have formulated elsewhere a complete classification of neuralgias of the head, and this I propose to abridge somewhat in order to bring it into line with the special branch of surgery which you practise.

A. Pains having an Organic Basis.

1. Lesions of Nerves.

- (a) Terminal twigs involved in $\left\{ \begin{array}{l} \text{Injuries.} \\ \text{Infective processes.} \\ \text{Tumours.} \\ \text{Vascular processes.} \end{array} \right.$
- (b) Trunks involved in $\left\{ \begin{array}{l} \text{Tumours.} \\ \text{Changes at foramina of exit.} \end{array} \right.$

2. *Lesions of Ganglia.*

(a) Spheno-palatine ganglion.

(b) Gasserian ganglion.

B. Pains having no known Organic Basis.

(a) Essential trigeminal neuralgia.

(b) Hysterical pain.

I shall deal with each of these in turn.

Lesions of Terminal Twigs.—The pains referable to the terminal twigs of a nerve admit of a classification other than the above, based upon the actual way in which the nerve filaments are stimulated. For example, in cases of injury to the jaw, or of alveolar tumour, the determining factor is (at least in the beginning) the mechanical one of pressure exerted by a body outside the nerve. On the other hand when an infective process is present, the fibrils are stimulated not only by the pressure of inflammatory products around the nerve, but also by the formation of new reactive granulation tissue within the nerve sheath, a change to which the term "neuritis" is applied. The distinction is of importance in considering the prognosis of any given case, for when the cause of a pain is purely mechanical its removal results in immediate recovery. On the other hand, it may take some time for a nerve which has been long inflamed to absorb or cease to resent the presence of the new tissue which has surrounded its fibrils. A condition analogous to the latter is sometimes seen after amputations, where fibrosis of the nerves may be present far above the level of their division; consequently the removal of the distal part of a nerve which is painful after an amputation is not always followed by relief.

Injuries.—It has often seemed to me remarkable that the average extraction is followed by so little immediate or delayed pain, accompanied as it is by some damage to the alveolar margin. In addition to the possibility of compression by bony splinters, there is the organisation and contraction of the septic granulation tissue by which the empty socket is repaired. That pain of a very violent type can be produced in the jaws by a bony spicule displaced during a tooth extraction is well established—witness Bell's note in John Hunter's treatise "On the Teeth." Speaking of local neuralgia he says: "I have seen a case in which every constitutional remedy usually employed in tic douloureux had been employed without effect for an affection of this kind, which had become excessively violent in its attacks; and on learning that it had existed since the extraction of a tooth the part was carefully examined, and a small spicula of the alveolar process was discovered under the edge of the gum, on touching which the paroxysm of pain was instantly excited. The removal of this spicula was at once successful. This case is here mentioned to show how trifling a cause may produce the most severe pains of this description, and to point out the necessity for a careful and even minute examination of the part in which the pain appears to commence."

To this advice, now nearly a century old, there is nothing to add. *Infective Processes.*—Pyogenic infections of the nerves and of the structures which they traverse may arise in a number of different ways. Pulpitis and periodontitis are the most important, and of these I am not bold enough to speak to you. I should like, however, for my own information, to raise the question of the advisability of leaving devitalised teeth in the alveoli. A year ago, while in America, I noted there a decided tendency ruthlessly to remove such teeth, on the ground that unsuspected suppuration about their roots might give rise to chronic changes of an inflammatory nature in the related nerves, as well as to lesions elsewhere in the body. Without uncovering that dental bone of contention, the possibility of sterilising and completely filling the root canals, it would be interesting to have from the meeting an expression of opinion as to the possibility of such teeth becoming a source of neuralgic pain. In any case the granulomatous masses to be found about the apices of dead teeth must involve the filaments of the apical nerve plexuses, even in the absence of actual pus. There is also a condition of unilateral enlargement of the superior maxilla, apparently as a result of infection with organisms of attenuated virulence, but in my limited experience deformity and not pain is the feature most prominent in the mind of the patient.

The essential points characterising these neuralgias of local infective origin may be summarised as follows:—

- (1) There is a history of an introductory period when pain is confined to the situation of the damaged tooth, and is excited by various local external stimuli.
- (2) Superimposed upon this “blanket of bruised pain” there may be neuralgic crises, lasting from a few minutes to a quarter of an hour or longer, and occurring at variable intervals both by day and by night. In these crises the pain is lancinating and radiates to related areas in the territory of the fifth nerve, particularly to the temporo-malar region. Its severity gradually diminishes until the patient is left with the previous dull throbbing constant pain.

The cardinal point, then, is the continuity of some kind of pain. This is the type of case in which attention to the local cause by the dental surgeon usually gives permanent and often immediate relief. In a few cases of long duration some surgical procedure such as avulsion of the inferior dental nerve may be required, and it may even be necessary to inject alcohol into a main branch of the fifth nerve. I need hardly mention to you the help to be derived from radiography in clinching the diagnosis, or in revealing an unsuspected apical abscess; although Dr. Balfour Black tells me that when apical suppuration has become chronic there is rarely any pain.

Tumours.—When pain is associated with a tumour of the jaw, however small, the growth is usually of a malignant nature, although

some sarcomas grow painlessly at first. In these cases there is seldom any doubt as to the cause of the neuralgia. Odontomes may be painless until they erupt; they are then apt to become infected, and at this stage may give rise to pain. When an innocent tumour is accompanied by pain it is usually situated in the lower jaw, where it may compress the relatively large inferior dental nerve. In the category of innocent tumours may be included those cases in which an erupted tooth gives rise to pain. Such pain is usually dull, grinding and continuous, although changes in the size of soft "tumours," as a result of variations in their blood-content, may give rise to paroxysmal exacerbations.

Vascular Lesions.—Occasionally an elderly patient who has lost all or nearly all her teeth complains of a dull boring type of pain, remarkably localised to one spot on an alveolus. Examination reveals no abnormality, and an x-ray photograph shows nothing more than some bony sclerosis not untoward in aged people. There are two theories to account for this condition. Some hold that the terminations of a twig of the fifth nerve are compressed by the compact bone or are particularly affected in the general vascular insufficiency, while others hold that the pain is central in origin and due to a localised patch of cerebral softening. Whatever the cause may be, local excisions of portions of bone do not cure the pain, although patient may plead for such an operation in the mistaken belief that the disease is cancerous. Elderly females are most often affected.

Lesions of Nerve Trunks.—Sometimes a patient consults his dental surgeon on account of continuous grinding pain in either upper or lower jaw, possibly with occasional paroxysms of lancinating pain, resembling those of trigeminal neuralgia. Nothing abnormal can be made out in teeth or alveoli, and sooner or later it is discovered that the patient has a malignant tumour, either of the pterygoid region or of the naso-pharynx; but in a remarkable number of cases the neuralgia is for a considerable time the only symptom of which complaint is made. However, after a negative report from the dental surgeon, a neurological investigation may disclose clinical features which lead to an examination of the naso-pharynx and detection of the tumour. The multiplicity of these features forms a most interesting chapter in clinical neurology: here I will restrict myself to mentioning one or two prominent findings. Thus there may be pain associated with anæsthesia in any part of the face, lips and gums corresponding to the branch involved. This "anæsthesia dolorosa" is highly suggestive of such a tumour. In the case of the maxillary nerve the growth is usually in the pterygoid region, and with maxillary neuralgia there may be internal squint from paralysis of the sixth nerve. When a tumour of the naso-pharynx implicates the mandibular branch, in addition to neuralgic pains in the lower jaw there may be lowering of the half of the soft palate on the corresponding side, either as a result of the pressure of the tumour itself, or from the paralysis of its elevating muscle, which is innervated

through the otic ganglion, to which I have already drawn your attention; in addition, blocking of the Eustachian tube which may give rise to deafness.

If the growth has involved the motor part of the fifth nerve the dental surgeon may detect a most significant sign in the malocclusion of the teeth, which results from unilateral palsy of the muscles of mastication. It is of clinical interest that when a fracture of the middle fossa of the skull has passed through one or both of the foramina by which these nerves leave the cranial cavity, in the process of healing new formed bone may press upon them, so that a similar syndrome results. Sometimes in elderly people thickening of the periosteum lining these foramina leads to like complaints.

LESIONS OF GANGLIA.

Spheno-palatine Ganglion.—"Spheno-palatine" neuralgia was first described as a clinical entity by Sluder, although his view of its causation cannot be considered final. It is a type of pain which, I imagine, must be known to many of you; for nearly always attempts—and it may be said at once fruitless attempts—have been made to relieve the condition by extractions, sometimes on a wholesale scale. I shall quote Dr. Sluder's description of the syndrome: "The neuralgic picture is pain in the root of the nose and in and about the eye, in the upper jaw and teeth (sometimes lower jaw and teeth) extending backward under the zygoma to the ear, frequently making earache and pain in the mastoid; but severest often to a point 5 cm. back of the mastoid, extending thence to the occiput, neck, shoulder-blade, shoulder, breast, and when severe, to the arm, forearm, hand and fingers; with sometimes a sense of soreness on that side. Rarer additions to this picture are itching of the skin of the upper extremity, taste disturbances (parageusia), a sense of stiffness and muscle weakness in the upper extremity and fortification scotomata. Mild cases are described as a sense of tension in the face and stiffness or rheumatism in the shoulders. It may appear as constant pain with exacerbations, or it may stop and reappear cyclically as a migraine; or it may stop and reappear with stabbing sharpness as a tic."

This type of case is among the least satisfactory from the point of view of successful treatment, and dental operative measures are useless. Indeed, the pain has persisted after surgical removal of the spheno-palatine ganglion, and by no means the final words have been said upon its etiology and treatment. It is probably quite true that suppurative processes in the antrum of Highmore can overcome the thin bony barrier between that cavity and the pterygo-maxillary fossa, which contains the maxillary nerve and Meckel's ganglion; but, as has been emphasised by Cushing, it is hardly logical to implicate the

spheno-palatine ganglion alone, to the exclusion of the adjacent trunk of the maxillary nerve. Moreover it is difficult to correlate the distribution of the pain with that of the nerves arising from the ganglion, or even with that of any or all of the branches of the fifth nerve itself. Maxillary sinusitis may arise from the extension of pus from about the root of an upper tooth, usually the first or second molar or the second bicuspid with or without a breach of the mucous membrane lining the antrum, but in the fully developed condition which Sluder describes, neither extraction of teeth, nor, be it added, drainage of the antrum, appear to relieve the pain.

Gasserian Ganglion.—Perhaps it may seem outwith my subject to bring to your notice, as a cause of alveolar and dental pain, those instances in which some form of tumour within the skull implicates the Gasserian ganglion. My reason for doing so is that I have had the opportunity of examining, in the terminal stages of coma, a patient who suffered from such a growth; and his early treatment had been dental. These unfortunates suffer from a continuous grinding pain in the alveoli and teeth, upon which are sometimes superimposed paroxysms resembling those of trigeminal neuralgia, and the temptation to extract what seem to be the offending teeth must be a strong one. Nevertheless it cannot be over-emphasised that when the teeth of such a patient show no evidence of disease, and radiography of the affected jaw reveals no lesion, the dental surgeon should stay his hand and advise a searching neurological examination. Associated signs similar to those I have already mentioned as occurring when the nerve trunks are involved by tumour growth may then be discovered.

B. Pains having no known Organic Basis.

Hitherto we have been dealing with types of pain in which we can usually point to a causal factor, although in some cases the distribution of pain has been difficult to bring into line with that of nerves. When we come to the consideration of major trigeminal neuralgia we encounter a problem of a different type. Here pain is felt almost exclusively in some part or parts of the distribution of the fifth nerve; but in spite of a great deal of careful investigation we are still seeking its cause. It will be convenient to recount, in the first place, some of the characteristics of this dreaded malady, and then review some of the hypotheses which have been advanced to account for its occurrence.

The disease begins toward the middle period of life. The right side of the face is almost twice as frequently affected as the left, and in something like 3 per cent. of cases the pain is bilateral. The subjoined table shows the frequency with which each division of the fifth nerve is affected; it is an analysis, by Dr. A. W. Adson, of 499 cases observed at the Mayo Clinic¹:—

¹ Adson, A. W., "Northwest Medicine," May, 1923.

Ophthalmic division alone	3 or 0.6 per cent.
Maxillary division alone	83 or 16.6 „ „
Mandibular division alone	107 or 21.4 „ „
Ophthalmic and maxillary	44 or 8.8 „ „
Ophthalmic and mandibular	4 or 0.8 „ „
Maxillary and mandibular	181 or 36.2 „ „
All three divisions	77 or 15.6 „ „

The clinical features of the affection are almost stereotyped. The pain is of a darting or burning nature, and first begins in the distribution of a terminal twig of the fifth nerve. The paroxysms of pain last a few seconds—up to half a minute or so—and there is complete freedom from pain between the attacks. Thus a patient, interrupted in the middle of a sentence by agonising pain, will complete his remark on its cessation. The singular periodicity of the attacks led the surgeons of John Hunter’s time to prescribe “the bark.” The disease progresses in two ways; the intervals between attacks become shorter and shorter, and the area over which pain is felt gradually extends until in an extreme case all three divisions of the nerve may be affected.

These paroxysms of pain are “touched off,” as it were, by many forms of peripheral stimuli. The acts of eating and speaking, the contact of water with the face during ablution, a gust of wind, a light touch; all may start an attack. There is often an area which reacts in this way to the slightest of stimuli; for example, in mandibular neuralgia, the skin external to the ala of the nose often provides such a “trigger zone.” Sleep is not usually disturbed, at least at first, because of the absence of external stimuli during repose. Reaction to the pain varies with each patient; some hold the face immobile, others make chewing movements, and in many vaso-motor disturbances such as flushing and lachrymation accompany the paroxysm.

In brief, then, the distinguishing feature of major trigeminal neuralgia is this: pain of paroxysmal type only, with complete freedom from pain between the paroxysms. The patient’s story immediately distinguishes such a case from one of minor neuralgia of dental origin.

The cause of trigeminal neuralgia is still to be discovered. Histological examinations of the affected nerves and of the Gasserian ganglion tell us nothing. From time to time disease of the teeth has been advanced as a causal factor, and dental surgeons were quick to point out that the preponderance of right-sided cases might be due to the more efficient cleansing of the teeth on the left side by right-handed people. Tooth extractions, even when the teeth are obviously unsound, have no effect on the ultimate progress of the disease; indeed, it is not uncommon to find that patients have had perfectly sound teeth removed in the hope of curing the pain. While the extraction of an infected tooth may bring respite, or even cut short for a time a series of attacks, the pain returns. It is curious how persistently the profession has incriminated

the teeth; yet more than a century ago John Hunter had discovered the error of this view. I wish to quote to you the description of this disease which is given in his work on the teeth, a monograph which established dental surgery, previously the "trade of ignorant mechanics," as an important branch of our profession.

"There is one disease of the jaws which seems in reality to have no connection with the teeth, but of which the teeth are generally suspected to be the cause. This deserves to be taken notice of in this place, because operators have frequently been deceived by it, and even sound teeth have sometimes been extracted through an unfortunate mistake.

"This pain is seated in some one part of the jaws. As simple pain demonstrates nothing, a tooth is often suspected, and is perhaps drawn out; but still the pain continues, with this difference, however, that it now seems to be in the root of the next tooth; it is then supposed either by the patient or by the operator that the wrong tooth was extracted, whereupon that in which the pain now seems to be is drawn, but with as little benefit. I have known cases of this kind where all the teeth of the affected side of the jaw have been drawn out, and the pain has continued in the jaw; in others it has had a different effect, the sensation of pain has become more diffused, and has at last attacked the corresponding side of the tongue. In the first case I have known it recommended to cut down upon the jaw, and even to perforate and cauterise it, but all without effect.

"Hence it should appear that the pain in question does not arise from any disease in the part, but is entirely a nervous affection.

"It is sometimes brought on, or increased, by affections of the mind, of which I once saw a remarkable instance in a young lady.

"It often has its periods, and these are frequently very regular.

"The regularity of its periods gives an idea of its being a proper case for the bark, which however frequently fails.

"I have seen cases of some years' standing, where the hemlock has succeeded when the bark has had no effect; but sometimes all attempts prove unsuccessful. Sea-bathing has been in some cases of singular service."

How little our knowledge of this malady has progressed since Hunter's day!

Others have considered that the disease is an affection of the Gasserian ganglion, but microscopic confirmation of this view is wanting. Still others hold that the sympathetic nerves are at fault, either directly or through their distribution to the blood vessels of the affected part.

Any discussion of the surgical treatment of this complaint is outwith the scope of my paper; I shall only remark that injections of alcohol into the main branches of the nerve, or into the Gasserian ganglion, give temporary relief, and that permanent and complete relief from pain, at a cost of permanent anæsthesia in the territory of the nerve,

can be secured by dividing the sensory root of the nerve behind the ganglion.

Hysterical Pain.

I wish to quote to you a most interesting case recorded by Parker of the Mayo clinic, not only because it shows that pain in this area may be hysterical in nature, but also because the determining incident occurred in the dentist's chair.²

"A woman, aged 52, came to the Mayo Clinic complaining of pain in the right lower lip. Two years before she had had some teeth extracted under nitrous oxide gas. The anæsthetist pressed the mask rather roughly on her face, and she complained that it was hurting her lower lip. She was told rather brusquely to keep quiet and go to sleep; this made her furiously angry, and she went under the anæsthetic with this emotion dominant. The first thing she thought of in coming out of the anæsthesia was the sore and bruised lip, but she made no complaint. On arriving home from the dentist's she ran into a domestic squabble. Her husband, because she had been away all day, had become suspicious and accused her of infidelity. From words they came to blows, and in the tussle her husband shook her and she hit him and broke his straw hat. When the commotion died down she explained where she had been and just how badly she was feeling. The pain in her lower lip was a rather prominent factor in the reconciliation, and as she made him realise that she was suffering he became greatly concerned, and from that time on this pain became a common topic in the household. She described the sensation as a bursting fullness that was constant day and night. She was an unstable, emotional and irritable person, with the characteristic hysterical make-up."

The treatment of such a case must be left to those who have special experience in the handling of so-called functional disorders. But it is important to remember that the immediate consequences of such trivial episodes—and such an one might happen to any one of us, irrespective of the branch of surgery he practises—may be permanently used by unstable patients as a convenient and plausible "way out" when they are confronted with tasks which they find uncongenial, or situations which they find difficult. The subject of these transferences of a local inferiority has provided much material for argument between the various schools of psycho-analysts. Whichever explanation we accept, whether we subscribe to the doctrines of Adler, of Jung, or of Freud, their occurrence is indisputable; and in bringing to your notice one from the practice of dental surgery I forearm by forewarning you. For when a patient is unduly susceptible to suggestion, not only trivial injuries (through a process of auto-suggestion) but also unguarded comments or questions on the part of the operator (through a process of hetero-suggestion), may furnish a basis for a similar neurosis.

²Parker, H. L., "Jour. Amer. Med. Assoc.," Nov. 22, 1924.

DISCUSSION.

In opening the discussion Dr. J. Mason Noble said: I have listened to Dr. Learmonth on the subject of neuralgias with great interest; I do not think I have ever heard a subject treated in such a lucid and concise manner. It is a subject of almost everyday interest to the dental practitioner, and while trigeminal neuralgia of the "tic" variety is not so very common, it is just this that makes it difficult for the dentist to diagnose and decide whether the cause and treatment is dental or is in the sphere of the neurological surgeon. Not the least interesting contribution from Dr. Learmonth is the patient he has brought to show the result of his operation of severing the sensory root of the fifth nerve. This gives the dental surgeon much confidence in advising for the relief of a patient suffering from an intractable trigeminal neuralgia. There is just one point which I have no doubt I have misunderstood, and that is where Dr. Learmonth speaks about septic infection in and along the nerve sheath as being the cause of neuralgia. Post-operative neuralgia can at times be very troublesome and prolonged, and I am not inclined to think that this is all due to sepsis, but much of it is due to tissue changes resulting from resolution in inflammatory tissue leading to cicatricial contraction along the nerve sheath with consequent compression of the nerve fibres. To make my meaning a little clearer I would like to give a brief description of a recent case. The patient, female, nervous and excitable, was sent for dental examination on account of eye trouble on the left side. The upper jaw was edentulous; the lower jaw, left side, showed gold crowns on the two premolars and on the first molar, a badly broken down amalgam filling on the second molar and a suspicious inlay on the canine. The patient had an idea that these teeth were not all they should be, but had nothing definite to complain about. The teeth were firm, percussion and thermal tests were negative, and the gums were healthy, except for some marginal gingivitis around the crowns. The crowns were removed and the pulp chambers of the crowned teeth were found to be empty and foul smelling. With little disturbance a temporary dressing was put in and an x-ray examination made; this revealed a long-standing abscessed condition of the crowned teeth, with signs of apical irritation in the canine and molar. Acute pain had by this time commenced, and the teeth were removed under gas without any difficulty. After this the pain became very acute and quickly took on all characters of a trigeminal neuralgia. The sockets were curetted and dressed daily, but in spite of this the pain persisted for six weeks, and relief was only got by the use of veramon. What I want to bring out is the complete absence of pain symptoms with the presence of sepsis, and the intense neuralgia on the removal of the septic conditions.

Mr. Hillier, referring to an inquiry by Dr. Learmonth as to the advisability of retaining pulpless teeth, said he had seen a patient with

twenty-one crowned teeth, all of which, after many years' service, were sound clinically and to radiographic examination.

Dr. Douglas, referring to the same point, said that in any discussion as to the advisability of retaining pulpless teeth, it should be stated clearly in the very first instance whether the discussion was concerning teeth already pulpless on arriving at the surgery, or teeth devitalised by the dental surgeon; and with regard to the latter class whether arsenic had been used, or if immediate removal of the pulp had been employed. In fact, the whole clinical history of each case and the technical procedures employed would have to be considered before any evidence of apical trouble could be admitted as evidence at all. This was the medical man's difficulty. He referred to an edentulous case in which, after he had curetted two areas of "rarefaction," a stubborn neuralgia was completely cured.

Dr. Stromier thanked Dr. Learmonth very cordially for his paper, and asked the members to accord a vote of thanks.

In reply Dr. Learmonth said he had received much information and had enjoyed the discussion. Dr. Douglas's case was probably one in which twigs of the mandibular nerve had become involved in sclerosis of bone.

Free Travelling Clinics for Northern Ontario Settlers



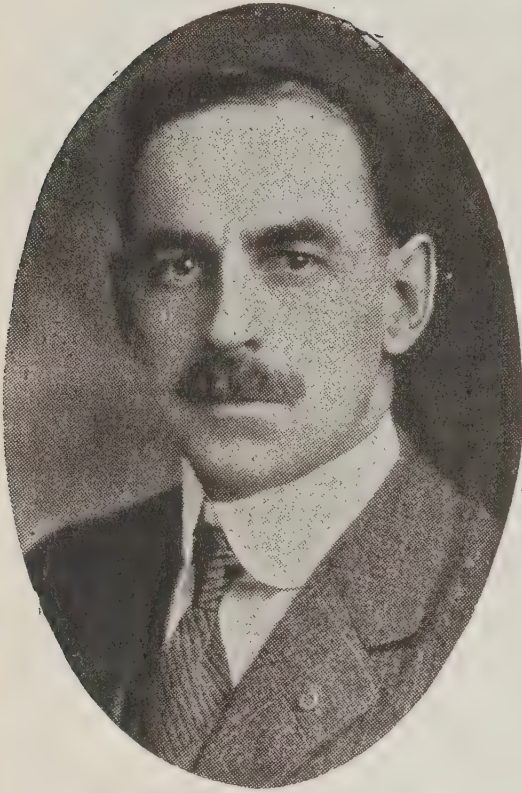
THE proposal that a free travelling dental clinic shall be made available to the people of Northern Ontario is commendable. The Star hopes that the Ferguson government will act upon it at the earliest possible moment.

The health of the people of a community cannot be maintained if their teeth are neglected. Not a few of the sparsely settled districts of the northern hinterland are without medical and dental practitioners, a condition that produces hardships and tragedies.

A Minister of the Crown who arranges for travelling medical and dental clinics to operate in Northern Ontario will increase the happiness and improve the equipment for life of a considerable number of pioneers who deserve well of the country. He will have many rise up to call him blessed.—*Toronto Daily Star*.

[The Ontario Department of Health has appointed Dr. W. Carson as Dental Officer for this service which is intended for the poor in those areas where dental services are not available.—Editor.]

Eastern Ontario Dental Convention



E. H. WICKWARE, D.D.S.
SMITH'S FALLS, ONT.

*President, Ontario Educational Association.
President, Eastern Ontario Dental Association.*



THE Fiftieth Jubilee Convention of the Eastern Ontario Dental Association will be held at Stanley Island, June 22nd, 23rd and 24th, 1927. A Jubilee dinner will be held on Thursday evening, at which the eloquent Canon Shatford, of Montreal, will be the guest of honour. On Friday the golfers will golf, and from the commencement of proceedings a most interesting and profitable time is promised. The Committee hope to have Doctors A. E. Webster, L. F. Krueger and F. A. Clarkson from Toronto, J. Nolin from Montreal, and D. C. W. Coup-land and Lorne MacLachlan from Ottawa.

Stanley Island is a really ideal spot for such a gathering, and members of the Profession are cordially invited to attend.

Diplomas of Graduation Received by Dental Nurses



FIFTEEN Dental Nurses were presented with their diplomas from the Royal College of Dental Surgeons at the graduation exercises held in the Dental Building, University of Toronto, on Wednesday, 1st June, 1927. The young women were attired in high-collared white uniforms and caps, and presented a smart appearance as they entered the auditorium and took their places. Their many gift bouquets were piled high on the long table across the front of the room, which was filled to capacity with relatives and friends.

PLEDGE IS TAKEN.

Dr. R. Gordon McLean, recently elected President of the Board of Directors of the Royal College of Dental Surgeons, acted as Chairman, presenting the diplomas and reciting the pledge, which the members of the graduating class repeated after him, as follows: "I solemnly pledge that in the practice of my profession I will always be loyal to

the welfare of the patients who come under my care, and to the interests of the practitioner whom I serve. I will be just and generous to the members of my profession, aiding them and lending them encouragement to be loyal, to be just, to be generous, to be pure, to be upright, to be observant, to be tactful, to be studious. I hereby give my pledge to devote my best energies to the service of humanity, in that relationship of life represented by the title of Dental Nurse, conferred on me by the institution in which I have been privileged to receive my training."

The Faculty of Dentistry trains the Dental Nurses, who attend a one-year course, and this class of fifteen was the seventh to graduate from the College.

In addressing the graduates, Mrs. H. P. Plumptre based her remarks on the pledge, pointing out to the young women just how much it might mean to them. All the little things of their daily routine, she said, might be done in the light of the great things, and be of great service to humanity.

The members of the class were the following: Bindon, Miss R. G., Toronto; Brown, Miss E. W., Hamilton; Craigmyle, Miss J. K., Toronto; Cumming, Miss B. K., Parry Sound; Gardhouse, Miss M. I., Weston; Howden, Miss M. E., Caledonia; James, Miss K. L. S., Toronto; Leask, Miss H. E., Toronto; Leslie, Miss E. L., Kingston; Miller, Mrs. F. E., Toronto; Miller, Miss J., Portage la Prairie, Man.; Nattress, Miss E. A., Detroit, Mich.; Shearer, Miss E., Ottawa; Tomkins, Miss F. I., Toronto.

Dentists desiring a trained office assistant are invited to correspond with the Dean of the Faculty, in whose office is kept a register of graduate Dental Nurses and those of the recent class who have not obtained a position.

Canadian Dental Hygiene Council



THE annual general meeting of the Canadian Dental Hygiene Council, held on June 14th, at the Granite Club, Toronto, for the purpose of receiving Reports, transacting business and Election of Officers for the ensuing year, will be reported in a subsequent issue of Oral Health.

THE FOLLOWING MATERIAL IS NOW AVAILABLE TO ANY PROVINCIAL OR SOCIAL ORAL HYGIENE COMMITTEE, OR DENTIST.

Information Useful for Preparation of Public Dental Lectures:

A thirty-five page booklet, containing statistics and general information on all phases of Dentistry, with a special Oral Hygiene appeal. It also gives directions for the establishment of School Dental Clinics, including the cost of same, and list of equipment necessary.

The Dental Guide:

An educational pamphlet on Oral Hygiene, particularly suitable for Parents, Young Men and Women, School Teachers, Nurses, etc.

Outline Lectures for Special Groups:

Outline for Address to Rotary, Kiwanis, Lions, etc.

“ “ “ “ Boy Scouts.

“ “ “ “ on Preventive Dentistry.

“ “ “ “ Mastication.

“ “ “ “ Irregularities of the Teeth.

“ “ “ “ Tooth Decay, Its Cause and Prevention.

“ “ “ “ Mouth Hygiene and Public Health.

“ “ “ “ To preserve the Teeth.

“ “ “ “ What Examinations Reveal.

Specially Prepared Complete Lectures:

Lectures to Public Health Nurses.

Simple Addresses for School Teachers to Read to Pupils.

Suggestions for the Conduct of Public Dental Service for Children.

Annual Reports of Dental Service, Department of Health, Toronto, 1925-26.

Radio Talks:

Preventive Dentistry.

Exercise.

Health Day.

Stories for Child Groups:

Oral Hygiene Stories.

Better Health, Stories and Songs.

Health Almanac, 1927: Department of Health, Province of Ontario

Newspaper Articles:

1st.—List of Titles—(Dentist to write his own material.)

2nd.—List of Titles—(With a short suggestion for each.)

3rd.—Complete, ready to print—(A charge of \$1.25, to cover cost of multigraphing.)

Lantern Slides:

Books containing photographs of slides, some with text suggestions, will be sent on request. Slides can be purchased at twenty-five cents each.

Moving Picture Films:

These will be available for the autumn. Three film-titles to be announced later. These will be loaned to Provincial or Local Oral Hygiene Committees.

Book Shelf Service:

The Council will, on request, try and secure the best and latest books on any phase of Oral Hygiene and Preventive Dentistry.

Address all requests for any of the above listed material to the Secretary of the Canadian Dental Hygiene Council, 86 Bloor St. W., Toronto, Dominion Headquarters.

The Advantage of Nitrous Oxid-Oxygen in Oral Operations*

B. H. HARMS, D.D.S., OMAHA, NEBR.



WHETHER nitrous oxid-oxygen is contra-indicated or indicated in any given case, depends upon the principles of administration and not at all upon the gases themselves. Its indications depend upon the ability and inclination of the operator and the condition and attitude of the patient.

A brief review of the indication for nitrous oxid-oxygen in general might not be out of place at this time before definitely stating the advantages of this wonderful anæsthetic for oral operations.

Nitrous oxid-oxygen anæsthesia is directly indicated in those conditions which are the gravest risks for operations.

In anæmics it does not increase the blood dyscrasia and the vital oxygen need can be adequately met.

Blood pressure can be maintained in cardiacs and the operative procedure made a rest period instead of an exhausting ordeal.

Toxemias are not exaggerated, because nitrous oxid-oxygen is a physical and not a liquid-solvent anæsthetic.

In diabetics, diet, insulin and nitrous oxid-oxygen are the essentials in preventing post-operative coma. In these cases nitrous oxid-oxygen anæsthesia is indicated because it does not increase the conversion of liver glycogen nor hamper the kidney's excretion of sugar, acetone or diacetic acid.

Nitrous oxid-oxygen is particularly indicated in the weak and the debilitated in the pulmonary, cardiac and nephritic complications; in the anæmic from old age or recent hemorrhages in the inflammatory states and in old age.

With these few brief, and, in a way, general remarks, I will proceed with the main subject of the paper by stating for you five outstanding advantages to the patient of using nitrous oxid-oxygen in oral operations and discussing each one briefly, assuming always that the proper principles of administration are understood by the operator and always carried out.

1. First, nitrous oxid-oxygen is of particular advantage in those operations in the mouth which require the longest operative time and the most exacting surgical technique, such as the removal of deep impacted teeth, the alveolectomies and the surgical removal of teeth, the removal of cysts and the operation on the maxillary sinus.

It seems to be firmly instilled in the minds of ninety-nine per cent. or more of both medical and dental practitioners that nitrous oxid-oxygen

*Read before the Otoe County Medical Society, Nebraska City, Neb., October 11, 1926.

anæsthesia in oral work can and should be used only in the short operation, and that none of the finer surgical technique can be properly and successfully carried out. The dental or medical school that teaches this subject any differently, either by lectures or clinical demonstrations, is the exception rather than the rule.

The rule should rather be that the longer the operation and the more exacting the surgical technique, the more the need of nitrous oxid-oxygen. The action of this anæsthetic itself is definitely known and there is no other known anæsthetic, either general or local, that so well (although not completely) protects the brain cells from shock and at the same time producing no tissue or chemical change in any organ or tissue cell. The greatest danger to the patient is the unknown ability or action of the operator or anæsthetist.

In these lengthy operations the patient is always comfortable—there is none of the feeling of exhaustion that the patient gets after a twenty or thirty-minute operation under the local anæsthetic, even though the pain is not objectionable, the retraction of the tissues of the cheek, lips and the body position maintained by the patient soon wears the patient out, and this is probably one of the greatest arguments, although seldom admitted, for the instalment removal of teeth.

I believe⁶ that the use of nitrous oxid-oxygen is safe, not in that it protects the nervous system from trauma, but that it does not per se exhaust the suprarenal glands and in that it removes the element of fright.

Fright is one of the greatest agents we have in epinephrin exhaustion. I believe that it is for this reason that depletion of the epinephrin content in the suprarenal glands occurs with local anæsthesia, in spite of the fact that all patients operated on are handled as gently and diplomatically as possible. Most patients can go through local anæsthesia operations without pain. They may smile, but it has been my observation that after operation the facies changes. The changed appearance suggests shock. Further than this, I have seen shock follow operation with local anæsthesia. This usually develops some time after operation, and as Harris says, "the patient flattens out."

The blood and saliva in all of these operations are best taken care of by the use of packs or gauze sponges in the hands of the operator or his assistant. By such means all of this adverse co-operation as demonstrated in a conscious patient is prevented.

2. Second, the sitting posture is natural, convenient, and the safest position for these operations.

Any patient that for any reason has difficulty in breathing will always assume the upright or sitting position. This position does not embarrass the heart action or the action of the muscles of respiration as the prone position so often does. Mortison¹ has shown that the blood pressure will rise to from 5 to 25 m.m. of mercury by simply changing the patient from the upright to the prone position, which is a point to remember in those cases of hypertension and cardiac lesions:

For the past ten years I have done mouth operations in no other way, and with a record of 20,000 cases, I have yet to see any unfavourable conditions, either during or after the operation, that could be attributed to the upright position. To quote Roberts² who uses this position for tonsillectomy: "This position, in addition to the advantage of having the parts in the position in which we are the most familiar with them, offers several other advantages."

(1) The ease with which the field of operation can be illuminated, either by an electric headlight, such as I use, or by natural or artificial light coming from behind and above the surgeon's head.

(2) The ready accessibility of the parts to be operated on.

(3) The freedom with which an assistant can hold instruments and can sponge the field of operation.

(4) The simple control of the hemorrhage at its source, and the prevention of the entrance of blood into the larynx.

(5) The thoroughness with which the operative field can be examined for tonsil remnants (in this case tooth remnants), tissue shreds and bleeding points after enucleation.

(6) The ease of control of the patient's head by the anæsthetist.

3. Third, nitrous oxid-oxygen does not, within normal anæsthetic limits, abolish cough reflex, thereby preventing the inspiration of blood or infective secretion from the mouth or upper air passages, causing pulmonary abscess and gangrene.

There is no other anæsthetic that does not abolish cough reflex on account of their greater power of relaxing muscular tissue, including the diaphragm and the intercostal muscles, which produce the act of coughing.

In these oral operations where the nasal inhaler is used and the throat is packed off, there is no way of knowing how much mucus is drifting down the back part of the throat from the upper air passages. The epiglottis has often been called the watch dog of the lungs and if the cough reflex is active any material, whether it be mucus, blood, saliva or foreign substances, as teeth or particles of teeth, tissue, etc., will be expelled.

Inspiration of blood and secretion into the lungs is an immediate danger to the patient by asphyxiation, and a remote cause of pulmonary sepsis, and pneumonia. Various positions, such as hanging the head downward, placing the patient on the side and various aspirators and suction pumps have been devised, in attempts to exclude these secretions from the larynx, trachea and lungs, but with a proper throat pack to prevent the blood and saliva from entering from the mouth, the cough reflex can be depended upon, under proper nitrous-oxygen anæsthesia, to take care of the secretions from the upper air passages.

During the influenza epidemic of 1918 and 1919, when hospitals were postponing their operations, except their emergencies, and doing without ether, the work in my office was in no way handicapped, and

except in one instance, where the patient proved to be a bleeder (hemophyliac) and unnecessarily exposed herself on a cold winter day, do I know of any post-operative pneumonias.

4. Fourth, nitrous oxid-oxygen does not interfere with the circulation and the oxygen tension of the parts, and secondarily does not cause edema, thereby increasing the susceptibility of the part to infection and auto-inoculation.

In a previous article³ I have pointed out that—briefly, the result of my clinical experience has been, that when I used a local anæsthetic for the removal of one or more infected teeth, the patient gets a more or less violent reaction or exacerbation of the existing infectious systemic symptoms, whereas, when using nitrous oxid-oxygen as the anæsthetic, such reactions or exacerbations have been absent or slight, even though a larger number of teeth have been removed, the technique of the operation in either instance being the same. On the one hand, auto-inoculation from the extraction of one diseased tooth under local analgesia has been violent enough to place a seemingly strong and robust patient in bed in the hospital, while, on the contrary, I have taken a bed-ridden patient out of bed in a hospital and under nitrous oxid-oxygen have removed all of the teeth—sometimes twenty or more—from the mouth, with a great amount of root-end and peridental pathology presenting, without any noticeable reaction or exacerbation. Having carried out this procedure in many cases, and having checked up results with hospital records of these cases, it certainly seems that the choice of anæsthetics in the extraction of diseased teeth is entitled to more consideration than has been given in the past.

My clinical experience, along these lines, has led me to believe that the interference of the local anæsthetics on the circulation of the blood, has more to do with the violent reaction or exacerbation which follows the operation on infected areas, than any other factor. I do not believe that the small amount of local anæsthetic used in these cases has enough toxicity to account for the striking results so routinely noted.

Members of the dental and medical profession have, for some years, been taught that when a large number of diseased or infected teeth were to be removed it was, or is, dangerous to remove too many at one sitting; the theory being that too large a number of bacteria, or too great quantities of toxin are set free in the invaded individual and that they may too rapidly overwhelm the body defences.

In my clinical experience such untoward results have not occurred when the choice of the anæsthesia has been given due consideration. An imperilling or disastrous result may, to a large extent, if not entirely, be prevented by the proper selection and use of the anæsthetic.

Irons says that the resistance⁴ of tissues themselves to the invading bacteria will also be a factor in determining whether the bacteria are quickly killed, or begin to grow. This bruised tissue, and tissue previously injured by disease, may be less resistant than normal tissues,

and may, owing to interferences with the blood supply, offer conditions of oxygen tension different from normal tissue and thereby be a more favourable culture medium.

In using local anæsthetics for an operation on infected tissue where the anæsthetic, to a greater or lesser extent, interferes with the circulation of the part to be operated on, either by infiltration or nerve-block, the same conditions are produced artificially, as exist in bruised tissue, namely, interference with the circulation and oxygen tension, and thereby, lowered resistance of that tissue to invading bacteria.

Unless local anæsthetics are most carefully used and trauma reduced to a minimum, there is much subsequent swelling of the injured part and great liability to infection. I do not know exactly, of course, why the infection occurs more easily in the injured tissues, but I am inclined personally to the view that, the lack of oxygen in the swollen tissue, aided, of course, by the good culture ground of blood and bruised tissue, tells the whole story. Nearly all of the organisms that produce these changes, are partial tension organisms, and to put them into a state of lowered oxygen tension, is to give them the advantage of development over that of the host.

The surgeon⁵ to-day knows that the key to the defence against infection possessed by any part of the organism is, its blood supply; that abundant blood and normal blood augmented by physiologic rest supply the natural "asepsis."

This brings us to the fifth⁶ advantage of nitrous oxid-oxygen in oral operations, the reason for which has already been explained, namely—any number of infected teeth can be removed at one sitting without the violent reaction or exacerbation which follow these operations on infected areas with other types of anæsthesia.—*The American Dental Surgeon*.

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¹ Mortensen-Anaesthesia and Analgesia, December, 1925.

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⁴ E. E. Irons, M.D.; Discussion of Edward C. Rosenow's paper, *The Journal of the National Dental Association*, November, 1919.

⁵ George W. Crile, M.D., The Value of Drugs in Surgery, *Current Research in Anaesthesia and Analgesia*, November 15, 1921.

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TO REMOVE PLASTER FROM VULCANITE DENTURES.—In a covered dish, deep enough and wide enough to hold several plates, put strong vinegar, allow the plates to remain therein a few minutes, then remove and brush with a stiff brush and water. If you keep the dish covered, the vinegar can be used over and over again.—Mary H., *Dental Digest*.

The Roentgen Ray

C. EDMUND KELLS, D.D.S., NEW ORLEANS.



UNDOUBTEDLY every graduate of 1927 has been taught the value of the x-ray and has received more or less training in its use, and again, undoubtedly, he must appreciate the fact that he has learned that it is impossible to practise the dentistry of to-day without constant recourse to the x-ray machine.

As whole books have been written upon this subject, in a short paper like this only a few of the "high spots" can be briefly touched upon.

Now here is a question for many a young dentist: When he leaves college and fits up an office for himself, will he consider an x-ray machine just as necessary as a cuspidor, or will he think that he can get along without x-ray work for a few years, his capital being barely sufficient for what he does consider necessary—such as a chair, cuspidor, engine, etc.?

I fear that many a man will be in that position—feel that he is not able to purchase this machine in the beginning, and yet, from my point of view, I can but believe that that would be a very serious mistake.

To my mind, when means are limited, the strictest economy should be exercised in purchasing the entire outfit. The most inexpensive dental chair, engine, cabinet, etc., will meet all necessary requirements. The office should be furnished throughout in the simplest manner possible, which it could be and yet be furnished in good taste.

However, when it comes to the x-ray machine, I am not so sure that the very cheapest might be the "best buy." The *factor of safety* should be considered when dealing with a powerful high-tension current.

It is conceded to-day that it is not possible to handle (diagnose and fill) pulpless teeth and their abominable root-canals without the use of the ray, therefore, root-canal work must be either checked up by the ray in some manner, or the work should not be undertaken.

Many cases which come to us cannot be diagnosed without the ray, and unless they are satisfactorily diagnosed, of course they cannot be successfully treated.

While I never could, for one moment, subscribe to the doctrine that "every new patient must be subjected to a full roentgenographic examination," because I know that in an ordinary dental practice such is not necessary, yet I feel equally assured that quite a few of our patients require the raying of some teeth.

Such being the case, what would I have a recent graduate do when he is fitting up his office? Well, it is this. Use every effort to install a machine, always remembering that the *machine in itself is of no value*. He must learn to take *creditable* pictures, and he must learn to read

them correctly. Otherwise, his x-ray work will be that of a faker.

And next, I'd instil into his mind the fact that he must never take unnecessary pictures for his patients and *charge for them*. He should take all the unnecessary ones his heart desires, but never a one of these should be charged for. He should only charge for the ones that really should have been taken. Let him get that deep down under his skin—it will pay in the end.

If it is not within reason to install a machine, then would I have our graduate arrange with someone who has a machine, an older practitioner if possible, to take his pictures for him.

Such a man would, I am sure, take these pictures in some instances, where the conditions warrant, at no cost; in other instances, at a specially low figure, according to the means of the patients of this young man just starting out in practice.

I speak advisedly upon this subject, because I have for years treated our young men in just that manner. It should always be a great pleasure for an older man to help along the newcomer in every way possible.

Most earnestly would I beseech him never to look at a film, point to a darkened area about the end of a root and say, "That dark spot is the shadow of an abscess."

In the first place, the *dark spot is no shadow at all*. All the *shadows* upon the film are *shown in white*. The darkened areas show lack of shadows. Remember that.

Equally important is it to remember the fact that an abscess cannot be shown upon a film. Pathology cannot be recognized upon a film. The characteristic markings of an abscess as registered upon a film are identical with those of some *normal* conditions of the bone.

Many a time have these characteristic markings of the antrum, of the mental foramen, or of the anterior palatine foramen, been mistaken for signs of pathology, and perhaps perfectly good teeth extracted as a result of this unwarranted ignorance.

When anyone speaks of pathology as being shown upon the film, he is just a little careless in the use of his words, because if he knows anything about the subject, he must know that pathology cannot be recognized upon a film. No infection, no abscess, can be recognized upon a film. The results—the effects—of pathology may be shown upon a film, but it is impossible to tell by looking at such a film, whether or not there was any infection at the time of the taking of the pictures. An examination of the mouth may at times disclose the presence of an abscess—the film, never.

My experience leads me to believe that a very large percentage of the pictures taken in routine practice are absolutely worthless from a diagnostic point of view, and I believe that most of these failures are due to improper development of the films.

No matter how fine the machine may be, no matter how skilful the

operator may be in taking the pictures, if they are not developed just right, the results will be unsatisfactory.

Undoubtedly the "time method" for developing is the better method, and every operator should have an arrangement by means of which the solutions are maintained at a constant temperature.

From sixty-five to sixty-six degrees is considered by the makers of the films to be the best temperature for development, and, as the makers should know, that's the temperature that we use.

The greatest of care should be given to the solutions. They should be clean—that is, filtered—fresh, and only the best chemicals used in their making, and distilled water should be used as well.

Again would I say that the greatest care should be given the developing system.

While it is generally conceded that the ray is absolutely indispensable in our practice, one should be well acquainted with its limitations, and not "see things" upon the films just because one desires to find them there.

This is the day of extremes and the day of fads. The use of the ray for making examinations of the teeth for cavities is one of the most recent extremes to which the ray has been subjected.

Every cavity upon a crown of a tooth is accessible to, and should be discovered by means of, a fine explorer and the mouth mirror.

The only exception to this rule is a very small cavity upon a proximal surface of a tooth when this surface is in direct contact with its neighbour. Here, under some circumstances, it is not possible to tell by a direct examination whether or not the tooth is decayed, but by means of cotton rolls, compressed air and silk, nearly every suspicious tooth can be recognised. When in doubt, the teeth should be wedged overnight, preferably with a thread wedge, in order to make assurance double sure.

I do not hesitate to affirm that a cavity that cannot be thus discovered by a *careful dentist* will prove to be entirely too small to be recognized upon a film.

I pray you, boys, never take pictures for the purpose of discovering cavities.

And now Editor Christian's time clock has "rung me off." I hope that "our boys of '27" will consider well these few ideas which I have "passed on" to them, appreciate them, approve of them—and live up to them. —*The Dental Student*.

What Time Is It?

Time to do well! Time to live better,
Give up that grudge, answer that letter,
Speak that kind word to sweeten a sorrow,
Do that kind deed you would leave till to-morrow.

Dislocation of the Mandible



ACCORDING to the *British Medical Journal*, of January 29th, C. Karell reports the case of a young girl whose lower jaw had been dislocated during the extraction of a carious molar. In spite of daily attempts at reduction, with and without anæsthetics, the dislocation remained unreduced for fifty days, and the patient could not close her lips on account of the displacement of the lower jaw. There was a gap of 2 cm. between the edges of the upper and the lower incisors, and in front of both ears there were projections produced by the dislocated articular surfaces of the mandible. The masseters were very prominent; lateral movements were possible, but with obvious limitation, and the patient had difficulty in swallowing and in articulation. A brief attempt at reduction was made, the patient sitting on a low seat with her head fixed. Continuous increasing pressure was applied on the lower molars, downwards and backwards. After some time the right side was seen to slip backwards slightly, but nothing further occurred. Two hours later another attempt at reduction was made, this time under deeper anæsthesia, the patient lying in the prone position with the head fixed. After prolonged pressure on the molars, combined with firm upward pressure on the chin, the right side was reduced, and with further intermittent manipulation the reduction on the left side was effected. The entire operation lasted forty minutes. Karell recommends that in all cases of long-standing dislocation of the lower jaw similar prolonged conservative manipulation should be employed before resorting to a cutting operation.

The Canadian Red Cross is Still Serving



THE first Red Cross annual campaign for funds is being held from Empire Day, May 24th, to Dominion Day, July 1st. It is hoped that every Dentist in Canada understands and appreciates the full meaning of this nation-wide effort, and that each will take his full share in promoting the Red Cross peace-time programme, with which our own work as a Profession is so closely allied. Each one of us can assist in two ways. First, financially, by making a generous contribution; and secondly, by assisting the local Society in promoting its organization. The Red Cross has very generously assisted, financially, the Canadian Dental Hygiene Council, so let us now, as Dentists, exert ourselves, both collectively and individually, to make the Red Cross Campaign a success.

“The Canadian Red Cross Society has always believed that an essential part of its duty in fulfilling its peace-time programme was to afford assistance and support to other organizations engaged in promoting health and preventing disease.”

"It does not duplicate services already being rendered."

"It has made contribution of more than Three Hundred and Twenty-Five Thousand Dollars (\$325,000.00) to other Health Organizations, such as Tuberculosis Society, The Canadian Dental Hygiene Council, National Committee on Mental Hygiene, Social Hygiene Council, Child Welfare, Public Health Association, Grenfell Mission, National Institute for the Blind, Ontario Medical Association, and many other similar bodies."

"Helpfulness is the Red Cross motto and co-operation its watch-word."

"The Canadian Red Cross Society is the largest 'Service Club' in Canada. Its membership is absolutely unrestricted, and its service to the Nation is invaluable. Only by our combined efforts will the goal be reached, and Canada be made the healthiest, happiest and most prosperous Country in the world. In view of the above facts, we would appreciate it if every member of the Profession of Dentistry in Canada would afford the Canadian Red Cross Society co-operation in every way in this Campaign for funds for its peace-time programme."

HOMO RHODESIENSIS.—*The Times* announces further discoveries in the cave at Broken Hill, where the famous Rhodesian remains were found four years ago. Two portions of human bones and a large number of bones of animals have been found, all of which may prove to be of great importance.

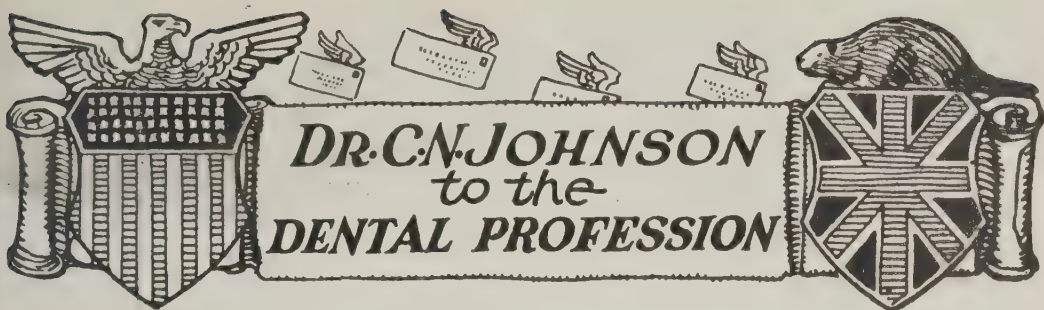
Dr. Hrdlicka, curator of the Division of Physical Anthropology of the United States National Museum at Washington, is making arrangements whereby a selection of the specimens may be examined at the British Museum at South Kensington, before any definite statements are made in regard to them.

In the meanwhile, Dr. Hrdlicka is of opinion that the animal bones show beyond doubt that the cave was occupied by a primitive man, on account of the characteristic method in which the bones have been broken.

TO REMOVE FACINGS FROM BRIDGES.—As there seems to be a diversity of opinion in regard to the proper method of removing cemented facings from bridges, may I offer a simple method I use in my office? Leave the bridge in commercial hydrochloric acid overnight, and you can very easily slide off every facing.

I wish to emphasize, however, the necessity for using commercial hydrochloric acid, as the pure or concentrated acid might cause damage.

This method is so simple it is surprising that it has not been offered to the profession heretofore.—George G. Weston, *Dental Cosmos*.



Tolerance

TOLERANCE comes very near to being the supreme virtue. When we consider all the trouble caused by intolerance, all the imposition and usurpation of authority and power, we are led to place tolerance among the chief qualities requisite for an orderly relationship between men. To be tolerant of the opinions and propensities of others—even of the peculiarities and peccadillos against which we run counter in men and women—is to ascend the heights and look serenely over the broader fields of vision.

Intolerance is manifest in many ways. If I insist that you accept my belief or my unbelief—if I pit my opinion against yours and force the issue till you are obliged to acquiesce or to defend yourself against my importunities, I am intolerant. Which is only another way of saying that I am unjust and narrow. What right have I to intrude my ideas or beliefs on you? It is a reflection on my perspicacity and good sense, and an offence against your intelligence for me to assume that my knowledge is superior to yours. When carried far enough it becomes arrogance of the worst type, and it is a species of arrogance that is all too common.

How do I know that my belief is right and yours wrong? Who endowed me with an intelligence that is superior to yours? Why can I not accept the fact that your judgment may be as good as mine, and that you have an equal right with me to exercise it? To constantly force my ideas on you is an insult, an assumption of my superiority over you which is not only egotistical on my part, but which is offensively boorish, and pettish, and small, and mean and contemptible.

Intolerance is at the basis of most of the contention among men, tolerance tends to harmony and good team work. Tolerance does not, in any way, mean a sacrifice of convictions or a concession to conscience. It means simply breadth of vision and liberality of mind. It means bigness of intellect, and power, and sureness, and grasp of things. Someone has said that tolerance “does not mean that one should not fight for his convictions, but he should do so with the recognition of the right of the other man to fight for his as well.”

That is always the point—the right of the other man. The moment we begin to recognize the rights of others, we not only grow in grace,

but we grow in mental stature—we are bigger, and better, and more lovable. Another has said: "Tolerance indicates an intellect hitting on all six; it mirrors a mind mellow with good humour. It loves light and laughter, and hates nothing—save intolerance."

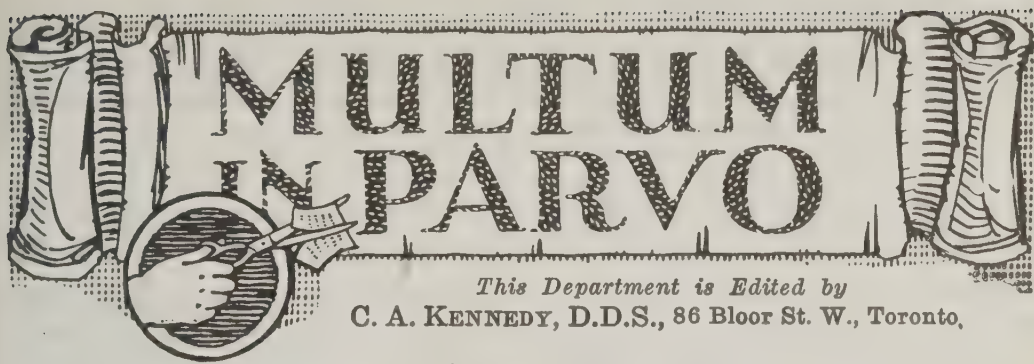
Intolerance is usually associated with a small mind, tolerance with a large mind. The greatest intellects of all the ages have shown the most tolerance, the frankest recognition of the eternal rights of concession and consideration. Lincoln was a tolerant man, one of the most conspicuous in history, and yet it never led him into vacillation or weakness. Lincoln never compromised with his convictions, but he made his mind a mirror to reflect the image of what the other man might be thinking. Lincoln accomplished his marvellous mission in life, and exercised his immense power over men through sheer force of character and his innate ability to put himself in the other man's place, and see the other man's point of view.

Hidden away in every human heart there is something fine and noble, and generous, and true. Some there are who, with strength of character and force of will, find it possible to bring to the surface the finer graces and let them shine before the world; others with smaller minds, tinged with intolerance, bury the better impulses of their natures and fail to give to the world the brightness that is really inherent in them.

How splendid it is to illumine the pathway of life with the sunshine of tolerance and loving kindness, shedding a smile here and doing a brave deed there, charitable of the whims of friend or foe, granting to others the privilege of self-determination—the right to think in their own way, to believe as they wish, and to follow the bent of their own convictions. All of this and myriads more of the finer things of life are grouped within the essence and substance of the thing that we call tolerance.

C. H. Johnson.

TO MAKE THE SALIVA EJECTOR ALMOST NOISELESS IN OPERATION.—The noise produced by the continued running of the water-tap operating the saliva ejector, discharging the mixture of water and air into the spittoon bowl, becomes most wearisome. If a rubber tube connection from the discharge pipe be made to the waste pipe below the spittoon trap, the stream being taken directly into the waste pipe, the sound is almost nil. There is, when in use, a cushion of air, due to bubbles rising, which will not allow the bowl to be flushed whilst the saliva ejector is working, but the two processes are not required simultaneously.—Frank D. Lamb, L.D.S.



THE "TROUBLE" SYRINGE.—The old type of hypodermic syringe proves a source of annoyance due to the fact that the leather washers, or washers of other materials, become compressed, and when the plunger is inserted the anæsthetic backs out from around the packing nut. To get a good compression at the joint the plunger can be left out, which causes the washer to swell. Then when the packing nut is screwed down, very often a little particle will become detached from the washer and will clog up the needle, usually rendering it worthless.

This trouble can be easily overcome by cutting out a lead washer that fits the plunger fairly snug and placing it in the packing nut after placing the leather washers therein. When the leather washers are placed in the packing nut alone and it is screwed down tight, the leather washers are forced out of shape into the barrel of the syringe.

If the end of the plunger is made cone-shaped on the carborundum stone it will slide in without biting the washers.

To those who prefer this type of syringe, this idea will prove quite useful.—*Dental Digest*.

EYE TROUBLE, OF DENTAL ORIGIN.—I have an interesting case. My patient has been in the hands of medical men for about two years, and he reported to me, from a dentist to whom he had been referred by his medical man, with what looked like, and, in fact, was, a most difficult extraction.

He complained of his eyelids closing, acute pain down right side of body, and general debility. During the time he was with me, he had one of these spasms, and could not open his eyes. I made a careful examination of his mouth, and did not see how it could be of dental origin. However, I took an x-ray, and removed a root, necessitating extensive chiselling, with the result that the eyelids remained open for three days and then closed spasmodically again. I found the wound closed, and opening it could detect no pus, but some loose bone, since removing which his eyelids have been normal. All pain has disappeared from the right side of his body.

Neurosis is suspected, although nerve infection and pressure may prove to be the cause.—*Dental Science Journal of Australia*.

DIRECTORY of DENTAL MEETINGS & OFFICIAL ANNOUNCEMENTS

*Dental Associations are Invited to use this Department Freely for
Announcements of Meetings.*

EASTERN ONTARIO DENTAL ASSOCIATION, Stanley Island, June 22-24, 1927
THE AMERICAN DENTAL ASSOCIATION—Detroit, Mich., October 24, 25, 26, 27, 28, 1927.

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*Oral Health will be pleased to Receive Additions or Corrections that Directory
of Names May be Kept as Accurate as Possible.*

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No. 6

EDITORIAL

Hospital Dental Services



EVERYWHERE in this issue is an article by Doctor Holbrook, Superintendent of the Mountain Sanatorium, Hamilton. Doctor Holbrook has been interested for years in the development of dental service, and is reported to have said at the Public Health Association Convention, held a few years ago, that no sanatorium could be efficiently operated without a dental service. It might be said with equal truth that no hospital or public institution could be efficiently operated without a dental service organized for the benefit of the patients.

The Ontario Government has come to a similar conclusion, and has announced the decision of the Provincial Secretary's Department to appoint dental internes in three of the larger Provincial Hospitals, two being for adults and one for the treatment and care of children.

A plan is being developed whereby internes living in hospital and carrying on research work for at least four hours per day, may arrange

to have such work count toward the degree of Bachelor of Science in Dentistry, when such research work is satisfactorily conducted under the direction of the Faculty of Dentistry of the University of Toronto.

Every effort should be made for the establishment of dental services in the hospitals of Canada. Members of the dental profession may be counted upon to give time to the poor of their community, provided hospital dental services are established upon the same basis as the other services of the hospital. The cost of dental supplies is a deterrent in some of the rural hospitals which do not receive a per diem allowance, as do many of the hospitals in the larger centres of population. It is hoped that Provincial Governments may recognize the need and provide a provincial grant to rural hospitals, that the poor of the community may be given dental treatment, which is now recognized as an essential health service.

The Ontario Dental Association Convention



NOW that the Diamond Jubilee Convention of the Ontario Dental Association has passed into history, hearty commendations to the Officers and Committees who were responsible for making it such an outstanding success, are in order. That they planned wisely and well was evidenced in the high standard set by the programme presented, the official functions and entertainment arranged, and the systematized division into clinic groups for concentrated instruction. Their efforts were rewarded by the largest attendance the Association has ever had, being close to eight hundred.

Those who were privileged to attend the Birthday Celebration held in the Great Hall of Hart House in conjunction with the College, and which was graced by the Lieutenant-Governor of the Province, the Minister of Health, and the President and Chairman of the Board of Governors of the University, had every occasion to feel proud of the public recognition accorded the Profession, and also of the eloquent utterances of those chosen to represent them in the various toasts.

As Canada is this year celebrating the sixtieth anniversary of Confederation, it was quite fitting that the Canadian Dental Association was associated with the Ontario Dental Association in this Convention. The presence of Dr. Clay, with his officers and delegates from the Provinces, added a note of distinction to the gathering. It is earnestly to be hoped that, as a result of their labours in drawing up a new constitution for the Canadian Dental Association, a strong National Association may be built up, which will be an active, virile force in drawing the Provinces together in a united Canada.

The Convention was also a homecoming for some of Canada's distinguished sons who are now leaders of the Dental Profession in the United States—our much beloved C. N. Johnson, the eloquent Don

Gallie, those masterly technicians, Russell N. Tench and Wm. D. N. Moore. In presenting life memberships to C. N. Johnson and Don Gallie, we honoured ourselves, and it was a sincere expression of the love and pride we hold for them.

While the Convention is the event of the year for the Ontario Association, we must not lose sight of the fact that this is only one of its year-round activities, and a large measure of its success is due to the wise plan recently worked out to put the Association on a permanent yearly basis with a membership from January to December, and a properly organized staff to co-ordinate the various activities and Committees.

The members freely expressed approval of the past year's work, and adopted without amendment the recommendations of the Nominating Committee for a most representative group of Officers and Committeemen for the coming year.—E. A. G.

Editorial Review

CONCERNING HUMAN ENAMEL: FACTS, EXPLANATIONS AND APPLICATIONS.



UNDER the above caption Doctor Arthur Hopewell-Smith discusses many interesting problems affecting human enamel, with numerous illustrations, in the *Dental Cosmos* of July last. At the outset the author states his intention of clarifying and explaining certain difficulties of comprehension which have arisen, and then proceeds to the question of the definition and origin of enamel.

Doctor Hopewell-Smith observes that most of the cells of the body probably last a life time, while the ameloblasts remain as living cells only a few months. When enamel is damaged in any way it cannot be repaired or restored, because of the early death of the enamel-forming cells from which it primarily originated. For the same reason it cannot undergo increase in amount (hyperplasia) or hypertrophy or atrophy. Enamel cannot react to those biological laws which govern the formation of new growths, and thus disease of adult fully-formed enamel is an impossibility.

The author also states that the word prism as applied to the enamel rods is another "terminological inexactitude." The dictionary meaning of prism is "a solid whose ends are similar, equal and parallel planes, and whose sides are parallelograms," while as a matter of fact an individual enamel rod or column is generally a solid calcified cylinder, owing to the circumstance that the ameloblast is a cylindrical cell. In discussing the shape of the rods, the author proceeds:

"A rod adopts, in most instances, the shape of an imperfect circle or

oval when seen crosswise. Its pentagonal, quadrangular or hexagonal form is due to the direct opposition and mutual adaptability of neighbouring rods, the particular outline being determined by the particular number of rods in immediate relationship with it.

"In order to show how a six-sided figure may be produced, a simple demonstration will suffice. A circle of any diameter can accurately accommodate, on a flat plane, around its circumference, six similarly sized circles; no more nor less. Round the edge, say, of a penny, when lying on a table top, there can be placed exactly six more circles of the same size—six additional pennies. If the central coin were of plastic material and equal pressure were brought to bear on its edges, a central six-sided figure would be constituted.

"Thus a perfectly formed enamel rod should be, and is, hexagonal in transverse section. The degree of perfection of the tissue itself is determined by the abundance or otherwise of the hexagon."

The following comparisons are made regarding the dimensions of the rods: "The width of a rod of human enamel is difficult to conceive unless recourse be had to some concrete, tangible form of evidence and proof. The width of a rod averages five microns. This fact leaves but little impression on the mind, since microns are too minute to be imagined without the aid of the microscope. Even the corresponding measurement of a one five-thousandth part of an inch cannot be easily estimated. When, however, comparison is made with some familiar object, the exceedingly small dimensions of a rod become readily realizable.

"The shafts of the hairs of the human scalp are, roughly, of two kinds—fine and coarse, the former measuring ten microns, the latter 162 microns or more in diameter. Therefore an enamel rod measures in width one-half the breadth of the first variety and of the coarsest variety one thirty-second. In other words, if a thick scalp hair be divided longitudinally into thirty-two parts, one of these would represent the width of a single enamel rod! The intercolumnar substance is generally less than one-fourth of that of each rod, *i.e.*, $1/20,000$ to $1/40,000$ inch."

Regarding the nature of enamel Doctor Hopewell-Smith declares that it is entirely devoid of cells, fibres, blood-vessels, nerves and lymphatics, and that there is no living protoplasm, no nutrition of, and no "organic content" in, enamel, and that enamel once fully formed cannot possibly degenerate, but can only be lost by chemical dissolution or adverse physical forces. The author refers to the enamel as "fixedly a solid mass—impervious, impermeable and unchanneled," and again that "enamel is a solid inert, inorganic body, entirely devoid of any vitality whatsoever."

Those interested in these questions are advised to study the complete article which deals at length with the phenomena of life and their apparent absence from enamel.

While the author makes out a very good case, we believe that the practising dentist who has been observing the changes that take place in the quality and tone of enamel under varying conditions of health and disease, and particularly evident during the period of pregnancy, will not be satisfied that the enamel does not reflect systemic conditions. In the mind of the writer, the most scientific and satisfying explanation of these clinical phenomena is that the enamel is osmotic and that chemical changes affect not only the exposed surfaces, but the whole structure of the enamel.

Doctor Hopewell-Smith, in a second article in *The Dental Cosmos* for May, 1927, deals with the colour, relationships, functions and reactions to injury and disease of human enamel with a brief statement of conclusions.

American Dental Association—Detroit's Welcome

BY PAT J. O'REILLY, M.D., D.D.S., PRESIDENT, DETROIT
DENTAL SOCIETY.



RIGHT now the eyes of nearly fifty thousand men and women in organized dentistry in the United States and Canada are focused upon Detroit. This will be true until October 24th, when some ten thousand will actually arrive in this wonder city to be "counted in" at the greatest gathering of the American Dental Association yet held.

We hope you will be among the ten thousand. Our invitation is urgent and our welcome is sincere; we know your response will be spontaneous.

You have long wanted to visit this City of the Straits. No better time than now! All the world knows something of Detroit's greatness—her magic growth, her diversified industries, her "wider Woodward," the world's greatest highway, her drives and her parks and her beautiful Belle Isle, the gem of all isles—all these and more await to help make your visit here memorable.

Then too, your friends will be here. And when a man is among his friends, the world can go hang; what more can he desire? Our men of Detroit welcome you to this beautiful city, the city of hospitality.

So start your plans to-day. Arrange your affairs accordingly. Whether you come by ship or by train, with your own little Ford, or by aeroplane, your needs will be anticipated and it will be our pleasure to make you feel that your friends are here awaiting you. You will want to come again.

TO keep clean, to do good work, to
earn friends, to be happy and bestow
happiness, to develop opportunity,
to serve where possible and learn not to
whine—this is success. There is no
greater. There is no other.



W. CECIL TROTTER, B.A., D.D.S.

*Chairman, Executive Committee,
Canadian Dental Hygiene Council.*

ORAL HEALTH

*A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION" AS WELL AS THE POUND OF CURE*



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No. 7

Canada's Diamond Jubilee

*Lord of the lands, beneath Thy bending skies,
On field and flood, where'er our banner flies,
Thy people lift their hearts to Thee,
Their grateful voices raise;
May our Dominion ever be
A temple to Thy praise.
Thy will alone let all enthrone;
Lord of the lands, make Canada Thine own!*

* * *



HIS month Canada celebrates the Sixtieth Anniversary of Confederation, and it is appropriate to review the general development of the country. The importance of Canadian wheat has received wide recognition; dairy products have a value of \$250,000,000 a year; the newsprint industry leads the world. Canada stands first in the production of asbestos, nickel and cobalt, third in gold and silver, and her known coal reserves are exceeded only by those of the United States and China. The country stands sixth among the great nations in total value of both imports and exports, and is excelled only by New Zealand in per capita foreign trade. Three great transcontinental railways, and shipping lines which sail all seas, transport her produce. At no time in Canadian history has the record of achievement been more convincing and at no time in the past have the auguries of the future been more favourable than in 1927, the Sixtieth Anniversary of Canadian Confederation.

It is wise to pause long enough to secure perspective of past accomplishment before attempting to summarize the present. Sixty years ago, Canada had a population of three million; foreign trade amounted to \$132,000,000; the annual value of mineral production as late as 1886 amounted to only \$10,-

000,000, and during the first ten years of Canada's life as a nation the wheat crop did not exceed 25,000,000 bushels. At that time, annual imports of wheat and flour exceeded exports by nearly 9,000,000 bushels.

To-day, Canadian foreign trade is twenty times as large as at the time of Confederation; manufactured products twenty times as valuable; the wheat crop sixteen to twenty times as large, and the ratio of increase in other agricultural products even greater. Mining products now have a value of \$225,000,000 and foreign trade amounts to more than \$2,300,000,000 a year. Many of the older people now living throughout the country have vivid remembrances connected with their share in this rapid growth. In the West, the settlers' hardships in new territory now bear fruit in such items as the \$500,000,000 grain crop of 1925, or perhaps a better figure would be the total value of the field crops which amounted to more than \$1,150,000,000 in that year.

Canada is the most important export market of the United States, taking 17% of the total exports of that country; and the United States, in turn, is the largest market for Canadian goods, taking 28% of the total exports of Canada. The suggestion has been made that since Canadian imports from the United States exceed exports to that country by \$221,000,000 a year, there will eventually be some readjustment in this balance of trade, tending to permit a larger volume of Canadian goods to enter the United States. It is anticipated that the growing need for foodstuffs in the United States will eventually take care of this discrepancy.

Great Britain is second only to the United States in imports from and exports to Canada. During the last twelve months, Canadian imports from Great Britain had a value of \$164,000,000 and exports amounted to \$447,000,000. It may be noted that the excess of exports to Great Britain is slightly larger than the excess of imports from the United States.

Within the past three years, good crops have been sold at prices which have enabled the farmer to liquidate a large portion of the debt incurred during the post-war agricultural deflation. Farm prices and industrial wages are high, ensuring well distributed buying power. Employment throughout industry is at new high levels and immigration shows improvement. Recent finds in the mining areas of Northern Ontario

and Quebec and the encouraging discoveries of oil in the West give promise that the most interesting development of the immediate future will take place in the mining industry. All basic indices point to the present as a time of sound development and suggest that during the next few years Canadian industry will pass through new stages which will make a comparison between conditions at the time of the One Hundredth Anniversary and those of 1927 at least as interesting as the contrast between the present and the time of Confederation.

Summary of Bulletin of the Carnegie Foundation for the Advancement of Teaching on Dental Education in the United States and Canada

IMPORTANCE OF HEALTHY TEETH.

 HE teeth are more apt to become defective or diseased than any other part of the body. In 1924, of the 135,640 officers and men in the United States Army—who as a group are presumably among the healthiest persons—112,507 were treated for dental disabilities. Disease germs that enter the body through decayed teeth, or along the side of disordered teeth, are frequent causes of such serious and common maladies as rheumatism, kidney trouble, and heart failure. There are nearly 70,000 dentists in the United States and 4,000 in Canada, the number of physicians being only twice as large in each country. During 1925, in the United States, 326 manufacturing establishments made dental goods, exclusive of instruments and machinery, valued at \$38,769,049, including \$5,947,729 for artificial teeth.

PRACTICE OF DENTISTRY.

Prevention of dental ailments, treatment and cure of dental disorders, and artistic placement of comfortable artificial substitutes for parts of deficient teeth, or for teeth that have been removed, are included in the practice of dentistry, which requires unusual mechanical skill and a keen artistic sense. Dentistry has attained its most advanced development in the United States and Canada, where it is highly organized and has long

been conducted as an independent profession. Physicians are not trained to practise dentistry and seldom give attention to dental conditions. For the professional education of dentists there are 42 dental schools in the United States and 5 in Canada, nearly all of which are contained in leading universities. Proprietary dental schools have ceased to be acceptable and only two survive.

DENTAL EDUCATION IN THE UNITED STATES AND CANADA.

The Bulletin that is summarized in the appended statements, considers many problems of public concern in the training of dentists. As the pioneer study in this field, it represents a prolonged effort, including visits to each dental school in North America, to understand existing conditions and to offer constructive suggestions. The author, Dr. William J. Gies of Columbia University, who is neither a dentist nor a physician, enjoyed the hearty co-operation of the organized dental profession, the faculty of each dental school, many officers and teachers in medical schools and universities, and numerous special students of higher education, in both the United States and Canada.

HEALTH SERVICE.

The Bulletin uses the term "health service," having obviously a broader significance than "healing art," to designate collectively all special efforts to maintain or to promote health, to prevent disease, to restore health by treatment and cure of sickness, and to ameliorate the discomfort, distress, and disability of incurable ill-health. Among the most important of such agencies, besides medicine and dentistry, are education for the prevention of disease, public health administration, nursing, and pharmacy.

RELATION BETWEEN MEDICINE AND DENTISTRY.

The public suffers when any group engaged in health service belittles the honourable efforts of another. In North America, dentistry has been practised primarily as a mechanical art concerned chiefly with measures of repair, and has not appealed to the imagination or interest of medicine. At most medical schools there is little or no instruction on dental disorders, and the students acquire the prevailing medical indifference to den-

tistry. At dental schools the students receive inadequate instruction in oral medicine. "Antagonism between medicine and dentistry cannot be explained on any basis of public interest or advantage and has no justification in any sentiments that are worthy of respect, for both professions are agencies for health service and cannot render it faithfully on any other conditions than those of earnest and effective co-operation." With growing understanding that dentistry is primarily health service, these traditional disharmonies should rapidly be replaced by mutual respect and helpfulness in the interest of better service for the patient.

DENTISTRY SETS A USEFUL EXAMPLE FOR MEDICINE.

Although medicine has not been interested in oral health-service, dentistry has set an example that medicine would do well to follow. For many years dentists have systematically encouraged their patients to submit to periodic examinations for the detection and treatment of dental disorders in their incipency and for the repeated application of measures intended to prevent or delay the development of disease. The importance of this procedure for children, in whom most dental abnormalities and defects may be arrested, cured, or corrected, cannot be over-estimated. These precautionary efforts exemplify an ideal of health service—to keep people well—that has not yet appealed strongly to the average practitioner of medicine, who, manifesting little concern about prevention of illness among his private patients, seldom gives them personal advisory health-service when they are not sick.

NEED FOR IMPROVEMENT IN EDUCATION FOR HEALTH SERVICE.

There is urgent need for great improvement in the quality of teaching in medical schools and for a complete reorganization of the medical curriculum, which is essentially that of fifty years ago overlaid with the redundancies of one scientific or clinical specialty after another, the load upon the student having become almost unbearable and the fundamental sciences quite detached from their applications. The medical curriculum should be reconstructed from the standpoint of practice rather than theory, so that the student may be led into technical knowledge largely through its applications and the bulk of the whole may be reduced to a quantity that can be taught effec-

tually and assimilated thoroughly. Instead of making the curriculum an educational kaleidoscope, in a prolonged, wasteful, and unsuccessful effort to train the young graduate to be as competent as an experienced physician, the programme of instruction should aim to prepare the student to initiate safely a dependable general practice, to continue to be an earnest student throughout his career, and to grow rapidly in capacity through experience.

CONCLUSIONS OF THE STUDY.

Among the most general conclusions of the enquiry are these:

(1) Dentistry is not only a mechanical art for the maintenance or restoration of dental functions and facial comeliness, but as one of the most useful means to keep people well and to cure or alleviate disease, it is also an important division of health service.

(2) Dentistry, in the quality and efficiency of its health service for the patient, should be made the full equivalent of an oral specialty of the practice of medicine, without impairment of its present mechanical and artistic efficiency in reparative treatment.

(3) This could be accomplished, without requiring the dental student to obtain a full medical education, through extension and improvement in universities of that system of dental education which, though separate from medical education, is closely related to it and should be more intimately associated with medical schools, hospitals, and dispensaries.

(4) Improvement of dental education, in accord with the suggested reconstruction of medical education, could best be brought about by pursuit of the following three main objectives:

(a) the preliminary education and the instruction in the fundamental sciences should be practically the same in general scope and quality as for medicine after the proposed improvement of the medical curriculum; (b) the training peculiar to dentistry should be sufficient to assure both ability to initiate safely a dependable modern general practice of dentistry and capacity to grow in proficiency; and (c) the most advanced phases of dental practice should be reserved for systematic optional graduate study by prospective specialists.

(5) These three main objectives could be attained through the requirement of (a) two years of preparatory work in an

academic college, including several extra courses such as mechanics and fine art, that would stimulate interest and develop ability in the prospective practice of dentistry or reveal ineptitude, (b) and three years of intensive and well-integrated effort in an undergraduate dental curriculum for the training of general practitioners only (the years to be lengthened by beginning them with summer sessions or otherwise, wherever favourite excesses cannot be discontinued); followed by (c) optional supplementary full-year graduate curricula for all types of specialists. On this programme, currently known as the "two-three-graduate plan," general practitioners could be trained in five years after graduation from high school.

ECONOMIC AND SOCIAL CONSIDERATIONS.

The proposed improvements do not disregard the economic and social factors involved. All but two dental schools in North America require at least one year of work in an academic college for admission to a four-year professional curriculum, or the equivalent in time—a total of at least five years after graduation from high school. At present there is no provision for the formal training of specialists, who, after graduation as general practitioners, are usually self-taught or acquire experience in association with specialists.

PREFACE BY PRESIDENT PRITCHETT.

In the Preface Dr. Henry S. Pritchett, President of the Carnegie Foundation, writes in part as follows: "It should be clearly understood that the proposal to reduce the course for general practitioners in dentistry to three years instead of four is not a step backward. It is an honest and sincere effort first to secure educated men for the profession, and secondly to integrate the professional course for general dentistry into a feasible and effective process of professional training."

"The recommendations made in this report do not contemplate the education of a group of dental practitioners at such a level, whether of training or of the cost of education, as will make the dentist inaccessible to the man of small means. On the contrary, the report aims to secure such a quality of general education and of professional training as is absolutely essential to the safeguarding of public health."

"The dental school is one of the most important of these agencies [for the training of a qualified body of public health

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servants]. . . . The facilities for the education it seeks to offer cannot be furnished on a commercial basis. It must have generous financial help, such as has been accorded in the last ten years to many of our medical schools, if it is to carry out its duty to the public health service. There is to-day no more direct method by which the public health can be served than to enable the universities to place their dental schools in a position to give the kind of education for which the world stands in need."

FINANCIAL SUPPORT OF DENTAL EDUCATION.

The early dental schools were proprietary institutions, but practically all of the existing schools are integral parts of universities. Despite the membership in universities, most dental schools have received indifferent financial support. Only six in North America have current income from endowment, nearly all of the universities having failed to impress upon the public the importance of this need. The announced inability of three universities, because of lack of funds, to continue their dental schools brings this national predicament of dentistry sharply to public attention. In order to improve dentistry in the public health-service, the dental schools need a much larger number of whole-time teachers, better equipment, more useful libraries, special means for research, and improved facilities in general, which cannot be provided without generous public assistance.

PREVENTIVE DENTISTRY FOR CHILDREN.

Prevention of dental deficiencies in children is the most urgent general responsibility of the dental profession. In 1918 it was estimated, by the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association that of 22,000,000 school children then in the United States "11,000,000 to 16,000,000 had defective teeth and all defective teeth are more or less injurious to health." In most children the enamel protective covering of the teeth is imperfect in spots. If these defects are noted promptly after the emergence of teeth, and the deficient portions removed and properly replaced by good fillings, before decay sets in or very soon after it starts, the repaired teeth may be preserved indefinitely, not only in position but also in good health.

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NEED FOR PUBLIC DENTAL INFIRMARIES.

General realization of the import of "preventive" dentistry, and of the lifelong benefits of special dental care for young children, have quickened interest in research for the discovery of means completely to obviate dental defects and also in the creation of a "growing number of public or semi-public agencies, chiefly under the auspices of educational and health organizations, for the wider extension of dental service, especially to children of pre-school age, to children in public schools, and to children of parents who are financially unable to pay the conventional fees of the private practitioner. . . . Benefactions such as the Forsyth Dental Infirmary for Children (Boston) and the Eastman Dental Dispensary (Rochester), associated with medical and dental schools and hospitals, are needed in all parts of this country and Canada for the solution of health problems that involve the co-operation of dentistry."

DENTISTRY AND DENTAL EDUCATION IN CANADA.

The main features of dentistry and dental education in Canada and in the United States are very similar. There has been a free international exchange of practitioners, and of professional associations and courtesies. The five existing Canadian dental schools are integral parts of universities, which do not regard dentistry as a branch or specialty of the practice of conventional medicine, thus departing from the custom in some of the European countries. The first of the Canadian schools was founded in 1875, thirty-five years after the establishment of the original school in the United States. The total number of graduates of all the Canadian schools (1876—1925) is 3,596, an annual average of 72. The graduates of the schools in the United States number approximately 85,000.

NUMBER AND DISTRIBUTION OF DENTAL PRACTITIONERS.

The number of dentists in the United States has been growing more rapidly than the general population, but the distribution is very irregular. The number of physicians and dentists, and their proportion of the population, in the United States and Canada (in 1925) are shown by these ratios:

	Dentists to Population.	Physicians to Population.	Dentists to Physicians.
United States	1:1758	1:767	1:2.3
Canada	1:2510	1:1025	1:2.4

In the United States the number of dentists has steadily been increasing on a rising plane of requirements in both the preliminary and professional phases of dental training. A study of conditions in Minnesota indicates that there is no important deficiency in the number of dentists in most communities having populations of 1,000 or more.

WOMEN DENTISTS.

Women have shown an increasing tendency to engage in dental practice. The growth in their number in the United States is indicated by these census figures: 1870—24; 1880—61; 1890—337; 1900—807; 1910—1254; 1920—1829; 1926—2100 (estimated). The capacity and opportunity of women to promote especially “preventive dentistry for children,” under conditions of growing public concern and appreciation, should attract much larger numbers to the field. Nearly all of the dental schools in North America are open to them. The present attendance is approximately 200.

RESEARCH.

There is urgent need for methods to prevent pre-natal development of defects in teeth, and to obviate the occurrence of dental disorders at all ages. Measures of repair and treatment also require continual betterment. “Comprehensive and co-ordinated research . . . which is essential for the discovery of ways and means for the prevention of dental defects [and their most effectual repair], cannot be conducted without adequate financial support. The dental schools, now without endowments, cannot provide it; but, if the best schools were given endowment funds in amounts sufficient to enable them to promote research, prospective discoveries of great importance for the prevention of dental and oral distress would be assured, and the public welfare would be enhanced enormously.”

Although infections of the teeth are frequently the primary causes of numerous types of fatal disease, many of which develop insidiously, there is regrettable uncertainty regarding adequate treatment of them. “Large financial resources for the study of these and related problems, if made available through a term of years . . . in a leading university, would be potentially one of the most useful benefactions that might be offered to afflicted humanity.”

Oral Salvation



FEW of us quite realize how necessary to future human welfare and happiness is the continued progress of dentistry. The teeth more often become injuriously affected, are more apt to become defective beyond the possibility of successful curative treatment, and are more commonly eliminated by surgery, than is any other portion of the human organism.

The most common important bodily defect among civilized peoples is dental decay, which may, if it proceeds far enough, occasion serious or fatal infection of the body as a whole. Dentistry has become remarkably proficient in the mechanical procedures of repair, restoration and replacement. Manual or digital dexterity here reaches a high point of perfection. No architect or engineer quite equals the practising dentist.

At times dentistry has had to face social disparagement and professional belittlement. Yet it has reached a high plane of usefulness, and promises even more. For centuries the teeth had no care except that given them by goldsmiths, jewellers, ivory turners, umbrella menders, engravers, barbers, and itinerant jacks-of-all-trades. Dentistry was long regarded as a specialty of applied mechanics, with only incidental relation to the art of healing.

In a series of reports on the study of dental education by the Carnegie Foundation a justified tribute is paid to the progress and proficiency of the profession, but the fact is pointed out that "neither dentistry nor medicine has learned how to prevent the general incidence of decay, or to halt the advance lines of infection through a decayed tooth, or with certainty to destroy all the organisms at the apex of an infected root, or to restore the health of the tissues about an apex where an infection has occurred."

It is admitted that the proper treatment of a tooth having an infected pulp and apex presents a series of very perplexing problems. Various opinions are held and unhappy disagreements abound. "Meanwhile the triumphs of partisanship often sacrifice the welfare of patients."

Until recently there has been a traditional indifference on the part of medical science to the preservation of teeth and the prevention and cure of dental disease. Teeth were regarded as so many stones, rather than as living parts of an

animate body. Their loss did not disturb physicians any more than did that of the hair. All this has changed, but the traditional separation of medicine and dentistry still leaves the teeth the only part of the body in a special domain of healing not included in the practice of medicine. Even now the medical schools pay little if any attention to clinical dentistry or to dental research.

Forcibly to include dentistry as a branch of medicine might cause needless demoralization. But dentistry will become the equivalent of an oral specialty in the practice of medicine. Dentists are tending to develop into sanitarians and oral physicians as well as engineers and surgeons. Yet the mechanical and æsthetic demands are so great that the profession is almost certain to remain separate.

But closer co-operation can and is being had between medical and dental schools. At one time many of the dental schools were proprietary, but there is a marked tendency for them to become ever larger and more important units in the great state or endowed universities.

The Carnegie Foundation, the Dental Educational Council and other organizations have a fine record of accomplishment in raising the standards of dental education. But the basic need is comprehensive and penetrating research in the biology of the subject. The refinement of materials used and the invention of useful devices have shown great advances, but there has not been as great a corresponding research leading to discoveries for the prevention of dental and oral maladies.

The universities are greatly in need of permanent funds for dental research. For the most part the dental schools lack endowments, and in some cases are obliged to keep the quality of their work to the level of their income from fees. Millions of people, perhaps most of the population, are directly affected in health and happiness by the relative lack of fundamental research in this field. Here, certainly, is an object that should commend itself to those who have been fortunate in amassing wealth.—Editorial, *Saturday Evening Post*, June 25th, 1927.

REMOVING CEMENT FROM CROWNS.—When time permits, instead of drilling out old cement from a crown it is desired to re-set (e.g., after repair, or treatment of root), leave crown for a few days in a bottle of liq. ammoniæ fort. (strong spirits of ammonia).—*British Dental Journal*.

The Canadian Dental Hygiene Council

THE annual meeting of the Council was held on Tuesday, June 14th, at the Granite Club,—Luncheon at 12.30. Gen. the Hon. S. C. Mewburn presided, and there were present: Mr. E. E. Reid, London, Ont., Vice-President; Dr. Eudore Dubeau, Dean, Dental Faculty, Montreal University; Col. Biggar, Col. G. G. Nasmith, and Dr. Ruggles George of the Red Cross; Mr. N. L. Burnette, Director of Health Education, Metropolitan Life, Ottawa; Dean Wallace Seccombe, Col. W. G. Thompson, Drs. W. C. Trotter, F. J. Conboy, Harold Clark, W. B. Amy, R. Gordon McLean, A. D. A. Mason, I. H. Ante, G. V. Fisk, F. C. Husband, G. W. Grieve, J. F. Adams, R. J. Godfrey, O. G. Plaxton, J. W. McDonald, W. S. Madill, A. M. Hord, R. Zimmerman, F. W. Barbour, E. Guest, C. E. Pearson, W. E. Willmott, A. J. Broughton, J. A. Bothwell, G. G. Hume, R. S. Woollett, A. W. Ellis, Arthur Day, J. F. Porter, J. C. Livett, H. S. Thomson, and E. A. Grant.

Gen. Mewburn in his opening remarks expressed his pleasure at being present, and congratulated the organization on the progress that had been made. He was glad to see that Mr. E. E. Reid, who was associated with him in the organization as Vice-President, was present, and also Dr. Dubeau of Montreal, Mr. Burnette representing the Metropolitan Life, which is doing such an important Health work, also Col. Biggar and other representatives of the Red Cross. He referred to the service rendered by the Canadian Army Dental Corps to the troops during the war, as demonstrating the valuable work which could be accomplished by this organization in promoting the health and well-being of the people of Canada in peace-time.

The Secretary read letters of regret at their inability to be present from:—Dr. J. H. King—Minister of Health, Ottawa; Dr. John A. Amyot—Duputy Minister of Health, Ottawa; Dr. Forbes Godfrey—Minister of Health for Ontario; Dr. W. J. Bell—Deputy Minister of Health for Ontario; Dr. C. J. Hastings—Medical Officer of Health, Toronto; Dr. J. T. Phair—Ontario Department of Public Health; Mr. J. E. Atkinson—*Toronto Daily Star*; Mr. W. A. Mullis—of the *Hamilton Spectator*; Mr. A. F. C.

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Fiske—Third Vice-President, Metropolitan Life, Ottawa; and Dr. Geo. D. Porter—Director of Health Service, Toronto University.

Regrets were also received from: Dr. Jas. Robertson, Chairman, Canadian Red Cross Society; Dr. A. E. Webster, Toronto; Dr. T. F. Campbell, Galt, Ont.; Dr. R. J. Sprott, Barrie, Ont.; Dr. S. A. Moore, London, Ont.; Dr. W. H. Woodrow, Brockville, Ont.; Dr. J. F. Roach, Wolfville, N.S.; Drs. Dalrymple, Trelford and Spaulding, Toronto.

Many of the above gentlemen could not attend as our meeting conflicted with important sessions of the Canadian Public Health Association, in annual Convention in Toronto.

As the Minutes of the last annual meeting have been distributed to all the members, and printed in the Dental Journals, it was moved by Dr. H. Clark that they be taken as read. Seconded by Dr. Amy.—*Carried*.

The Secretary then presented his report, and audited financial statement, and moved their adoption. Seconded by Dr. Bothwell.—*Carried*.

Dr. H. S. Thomson gave an address covering his work as Field Officer.

Dr. Trotter, Chairman of the Executive, presented the Report of the Executive Committee, and moved its adoption. Seconded by Col. Thompson.—*Carried*.

Before discussing Dr. Trotter's Report, the Chairman called on some of the visitors for a few remarks.

Dr. Dubeau, who had come up specially from Montreal, said he was very pleased to be present. He told of his visits to Ottawa in company with Dr. H. S. Thomson, to interview Cabinet Ministers regarding the grant. He was gratified that Five Thousand Dollars had been given this year by the Government, and hoped it would be doubled next year. They had done some Oral Hygiene work in Quebec, and expected to do much more in the future. At the last session, their Provincial Government had granted the sum of Fifteen Hundred Dollars, and commissioned Drs. Nolin and Forest to visit other centres in Canada and the United States, and prepare a report on Dental Service to be submitted at the next session of the Legislature, and they hoped this would lead to the establishment of Dental Services in connection with the Medical Health Services in Quebec.

Mr. E. E. Reid said he was glad to be present, and to be connected with an organization which had such an important

field, and which now appeared to be making progress. He was also glad to note that another Insurance Company, The Metropolitan Life, was represented in the person of Mr. N. L. Burnette. It was his own ambition that all the other Life Insurance Companies would combine to follow the lead of the Metropolitan in health education and thus help to promote the welfare and happiness of the people of Canada, by preventing disease and reducing the death rate.

Mr. Burnette, when he was called on, said he was absolutely "sold" on this organization, and the work it is doing. He appreciated the tributes to his own Company, and as a Canadian, he greatly admired the work of Mr. Reid and the London Life in giving a lead to what Insurance Companies should do in health work. In his own work he was tremendously struck by the fact that Oral Hygiene runs through the whole warp and woof of preventive Medicine, and he felt that his own Company would be only too glad to help in any way it could, the work of this organization. He had been much impressed by the reports presented and the plans of the Council, and he asked if the Council, through Mr. Reid, would let his Company know what way they could assist, and he would be only too pleased to give his support.

Col. Biggar spoke of the work of the Red Cross, regarding the grant they had made to the Council. He felt it was only due to the organization, because it was carrying out some of the things the Red Cross was striving for in its peace-time programme.

Dr. Trotter's Report was then brought up for discussion, and the following resolutions were presented.

"Resolved that this meeting commends the action taken by the Executive on the question of Dental Service and Oral Hygiene for immigrants, and requests that further study be given to this subject, in order that a definite plan might be worked out." This was moved by Dr. Ellis, seconded by Dr. Woollatt.—*Carried*.

"Resolved that this meeting endorse the suggestion of the Council co-operating with the Provincial Dental Association of Saskatchewan and their Oral Hygiene Committee, for the purpose of carrying on a carefully planned Oral Hygiene Educational Campaign throughout that Province within the next few months." This was moved by Col. Nasmith, seconded by Dr. Harold Clark.—*Carried*.

"Resolved that the number of the Executive be increased

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from fifteen to twenty, and the Executive be given power to appoint additional members up to that number." Moved by Dr. A. J. Broughton, seconded by Dr. W. E. Willmott.—*Carried.*

"Resolved that a hearty vote of thanks be tendered to the Canadian Oral Prophylactic Association for providing, without cost to the Council, the services of the Field Secretary, Dr. Harry S. Thomson, during the past year." Moved by Dr. R. G. McLean, seconded by Dr. C. E. Pearson.—*Carried.*

ELECTION OF OFFICERS.

It was moved by Dr. Mason, seconded by Dr. Amy that the present Officers be re-elected.—*Carried.*

It was moved by Dr. Woollatt, seconded by Dr. Godfrey that the present Executive Committee be re-elected, with power to add to their numbers in accordance with the previous resolution.—*Carried.*

Dr. Willmott moved that the present Auditors—Thorne, Mullholland, Howson and McPherson, be reappointed. This was seconded by Dr. F. J. Conboy.—*Carried.*

* * *

REPORT OF EXECUTIVE COMMITTEE.

Your Executive Committee are pleased to report that the affairs of the Council and the prospects for useful work are more promising than any time since its organization.

In August our Field Officer and myself attended the meeting of the Canadian Dental Association at Halifax, without expense to the Council. I presented a Report from the Canadian Dental Hygiene Council before a general session of the Association, which was received with a great deal of interest. Dr. Thomson and I also succeeded in gathering together representatives of several of the provinces who are interested in Oral Hygiene work, and discussed with them ways and means of helping them to carry on this work in their respective provinces.

During the recent combined meeting of the Canadian and Ontario Dental Associations in Toronto, I presented a Report at a large Oral Hygiene Luncheon Meeting, at which were present hundreds of dentists, and several prominent personages interested in this work. The Chairman of this Luncheon Meeting was Dr. A. W. Ellis, a member of our Executive,

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and Col. Geo. Nasmith, also a member of our Executive, gave a short talk on the work of the Canadian Red Cross.

During this Canadian and Ontario Dental Association meeting, Col. Nasmith, Dr. Grant, Dr. Thomson and myself arranged a breakfast meeting at the King Edward Hotel, for all the delegates from the different provinces to the Canadian Dental Association Meeting. We explained to them how we wished to carry on educational work in the various provinces, under the auspices of their Provincial Dental Associations, and asked for their suggestions as to how this could best be accomplished. The discussion which ensued should be of the utmost value in helping us to decide which province is likely to be the most fertile for our efforts in the near future. As the Province of Saskatchewan is well organized from a dental standpoint, and also has many Red Cross Outpost Hospitals, it seems to be the most appropriate place for us to carry on our organized Dental Health Campaign. In preparation for this plan, one of our Executive, Dr. F. J. Conboy, Director of Dental Services for the Ontario Government, who was attending the combined meetings of the Dental Associations of Manitoba, Saskatchewan and Alberta, held recently at Edmonton, gave a report of our activities to that meeting, and solicited suggestions as to how best we could help them in their oral hygiene work.

By making reports to the various dental Conventions in different parts of Canada, and by constantly publishing accounts of our activities in the Dental Journals and Public Press, we will gradually succeed in educating the dentist and the public in regard to the nature of the work we are attempting to do, and the results we hope to obtain, and in this way enlist their sympathetic co-operation.

The cumulative effects of the work done during the past two years in educating the members of the Federal Government as to the importance of the work we are doing and planning to do, has at last borne fruit in the form of a grant of Five Thousand Dollars (\$5,000.00) recently made to the Council.

The fact that the Canadian Red Cross had just reorganized our status as an important public health organization, by a grant of Two Thousand Five Hundred Dollars (\$2,500), was certainly a powerful influence in securing the decision of the Ottawa Cabinet. We particularly have to thank Col. Geo. Nasmith for his personal influence and work in securing

both these grants, and we also owe Mr. J. E. Atkinson, of the *Toronto Daily Star*, and Dr. Eudore Bubeau of Montreal, our unstinted gratitude for the splendid and unselfish work they did in connection with our appeal to Ottawa, without which we never could have succeeded. I wish that time would allow me to mention more in detail the work these gentlemen did, and also the work that many more of our friends cheerfully did to aid us in securing these grants.

It is now up to us to prove by our works that we are worthy of those grants and of more to come.

The educational work we have been carrying on so far has been greatly restricted by our lack of financial resources, and has been largely confined to lecture work by our Field Officer, and the distribution of educational material such as material suitable for lectures of different kinds, lantern slides, pamphlets, newspaper articles, etc., to dentists in various parts of Canada. Dr. Thomson, the Field Officer, in his Report has given you a more detailed account of the educational work that has been accomplished during the year. He has also given you an account of his trip to the Red Cross Port Nursery at Quebec, and the impression he received from his contact with the immigrants arriving there, as well as his view of the possibilities of improving these unfortunate mouth conditions.

We have to thank the Canadian Oral Prophylactic Association for so generously loaning us the services of Dr. Harry S. Thomson, nearly all of whose time is at our disposal to use as we see fit. The money grants which we have just received should enable us to make more profitable use of his time than we have been able to do in the past, owing to lack of money to defray his travelling expenses. The Ontario Dental Association has been very kind in giving us generous grants the last two years, and we trust they will be able and willing to repeat them this year. Unfortunately, the other Provincial Associations are not financially able to do much more than assist us with travelling expenses while working in their provinces.

This Council has now firmly established itself as an important member of the family of Health Organizations. These organizations all agree that the proper care of the mouth and teeth is one of the most important factors in the maintenance of general health in any community. Almost all medical authorities agree that clean mouths and healthy teeth are im-

portant adjuncts to the maintenance of general health, and, on the other hand, that focal infection at the apices of the teeth is responsible for many illnesses. Dr. Parfitt, of Gravenhurst Sanitarium, says that the relation of diseased teeth to heart disease, arthritis and anæmia, is widely recognized by the Medical Profession, but he doubts whether it is generally recognized that these latent focal infections favour the development of tuberculosis.

Sir William Osler said: "There is not one single thing in preventive medicine that equals mouth hygiene, and the preservation of the teeth." In fact, innumerable quotations of similar nature could be given relative to the importance of spreading the gospel of mouth health.

The benefits accomplished by the establishment of public school dental clinics and the teaching of mouth hygiene, are amply proven by results already obtained all over this Continent, where a few years ago over 90 per cent. of the children were found to have diseased teeth, whereas now this percentage has been more than cut in half. This improvement was brought about by having all the children's mouths examined at regular intervals, and defects of the teeth remedied immediately they were found. The number of delinquent and backward children has so decreased, that the time saved through more regular attendance and more mental alertness, has reduced the cost of teaching far more than sufficient to pay the cost of the Clinics, besides insuring the children longer and healthier lives. The results obtained by this kind of health work are probably more tangible than that of any other kind of health service.

Besides assisting in the spread of this Oral Hygiene work among the school children of Canada, this Council is anxious to carry the same message and also some kind of Clinical aid to worthy immigrants arriving on our shores, and lonely settlers in out of way districts far removed from the services of a graduate dentist. By working in co-operation with the Canadian Red Cross Society, it may be possible to give this service by making use of their Outpost Hospitals in the various provinces in which to establish a temporary or travelling Clinic. We hope to accomplish something along these lines during the coming year.

We would suggest that this meeting should express its approval of the efforts made by the Executive in connection with

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establishing Oral Hygiene instruction and dental services for immigrants.

We would like this meeting to endorse the suggestion of the Council co-operating with the Provincial Dental Association of Saskatchewan and the various Oral Hygiene Committees of that Province, with the purpose of carrying on a carefully planned Oral Hygiene Educational campaign throughout the Province within the next few months.

A resolution of appreciation should be sent to the Canadian Oral Prophylactic Association, for so generously placing at our disposal the services of Dr. H. S. Thomson, without expense to this Council.

Our Charter and By-laws at present only provide for an Executive Committee of fifteen members. As eight of these at present do not live in Toronto, and as it is difficult sometimes to be sure of having the necessary quorum of six, we would like this meeting to increase the number on the Executive to twenty, and give the Executive power to appoint the necessary members to make up this number. I may explain that the active work of the Council is now being looked after by a small sub-committee of the Executive, consisting of Col. Nasmith, Dr. Grant and myself, who report back to the large committee at frequent intervals.

The Executive is going to take under consideration the advisability of appointing a committee to confer with the Canadian Press Association, to arrange some plan of co-operation.

W. CECIL TROTTER,
Chairman.

* * *

REPORT OF THE FIELD OFFICER.

In order that we may extend our Council to its greatest sphere of usefulness, it is necessary that there be constantly carried on organization work, and this year this particular part of the work has been a very important phase of your Field Officer's activities. It is very necessary that organization work be carried to dentists and dental societies, and be it said to the credit of the Profession of Dentistry, fully 100% of the dental societies in Canada have assisted in the promotion of the work of the Canadian Dental Hygiene Council. The Canadian Dental Hygiene Council is not exclusively a professional organization; primarily, it was promoted by the

Profession, but its membership is made up of public-spirited men from every walk of life.

That the organization has proved its worth, is established by the fact that all of the Health organizations, both special and general, throughout Canada, have endorsed our programme; many of them have extended to us co-operation, and some of them very tangible assistance. The word "Dental" in the Canadian Dental Hygiene Council, does not pertain to the Profession of Dentistry, but to Dental Hygiene as practised and advocated by the Profession, and it is quite necessary, in order that our Council shall be a success, that we have the support of the greatest number of the dentists.

Thus we have considered, in the Canadian Dental Hygiene Council, that it was wise to put forth considerable effort in promoting the Canadian Dental Hygiene Council to Dentists, knowing that much of our work can be destroyed in a few seconds by a discouraging remark from a dentist, in whom the patient has considerable faith. Our endeavour has been to promote in the dentist the Oral Hygiene vision—and it is a wonderful vision, for it opens up an entirely new line of thought and activity to the man who has been carrying on his practice more or less mechanically, or largely from a restorative or reparative standpoint, and who has considered his work more for its lasting quality, and from the physical side of stress and strain and masticating properties. To these men the Oral Hygiene vision opens an entirely new field. While he is still concerned with restoring and repairing, he is more particularly concerned with the cause of the conditions which he is restoring and repairing. He looks back into the general life history of the patient and the patient's antecedents. He delves and digs into the diet, exercise and environment and habits of living of the patient. His outlook is changed from one concerning only the patient in the chair, to one concerning almost the entire community, and the result is that, having then gained this vision, his work is not only more lastingly done, but it is thoroughly, more efficiently done, and he is performing a greater service to his community and the public when his outlook is humanitarian rather than purely practical.

The Field Secretary of the Council has during the last few years covered Canada from Coast to Coast, meeting every Dental Organization, presenting to them the story of our

Council, and enlisting their aid and support in its general programme and the more special features of it.

In August of last year, your Field Secretary attended the Canadian Dental Association meeting at Halifax, and at that time gave a short report of one phase of our activities and gained personal contact with many dentists from different parts of Canada, which I am sure will be of value to the Council. He also attended the meeting of the New Brunswick Dental Society at St. John, N.B., and there again gave a report of the work we were trying to do. Later on in August, he met with the Prince Edward Dental Association and with them went into a situation which had arisen there regarding free dental treatment for the outlying districts of their Province. The request had primarily been inspired by a very active Red Cross worker and the Provincial Secretary, and as a result of our efforts, the Prince Edward Dental Society has appointed dentists who will carry on this work at intervals, on a salary basis, the contact with the communities being established through the Red Cross and the responsibility for the remuneration and the collection of fees, or the question of free service, is taken by the Women's Institutes of the community in which the work is being carried on.

During the past month, at the joint meeting of the Ontario and Canadian Dental Associations, a successful effort was made here to gain the largest possible contact with the dentists from different parts of the Dominion, and again we were unusually successful, for we had the unique experience of having eighteen men present from different parts of Canada, to attend a breakfast meeting, at eight o'clock in the morning, notwithstanding that there had been a very special event the night before, which kept many out of their beds until the small hours of the morning.

During the early part of last Autumn, part time of your Field Secretary's services were loaned by the Council to the Academy of Dentistry and the City of Toronto to assist them in carrying out any special activities in promoting Health Day.

Early this year, our efforts were concentrated in bringing to the attention of the Federal Government at Ottawa the work that the Council has already performed, and laying before the Cabinet an outline of the future programme, trying to impress upon the Government our belief that they should take some responsibility in carrying on this work. Our efforts

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here were partially successful, as you know, the Minister of Health making us a grant of Five Thousand Dollars, and we hope that before next year the Council will have done sufficient convincing work, that this amount will be doubled.

The problem of dental treatment for immigrants is one with which we have been concerned during the last two or three years, and this year steps were taken to find out all the conditions governing such an effort. To that end, through co-operation of the Red Cross, a trip was made to Quebec City, and an opportunity given to study at first hand all the machinery governing the reception of immigrants from the time they disembarked from the boat, until they were on their train for their point of destination. Through the splendid assistance given by Miss Tremayne, Nurse in charge of Port Nursery, to whom I owe a great deal of thanks, and also Dr. Laurie, chief Medical Officer, I was able to study the medical and civil examination at this port. The final decision on this is embodied in a report which was presented by our Executive Committee and is incorporated in the Minutes. Work for the immigrants would be a splendid humanitarian piece of work when the machinery is established to carry it on successfully, but I think before that work could be carried on, it will be necessary that regular points of contact be established so that the immigrant can have any necessary services rendered at point of final destination.

At the Council's Dominion headquarters, 86 Bloor St. W., Toronto, a large quantity of educational and Oral Hygiene material has been gathered. Requests for this material have been received from Dentists, Teachers, and School Boards from every Province in the Dominion. This consists of pamphlets, charts, cards, lantern slides and will later on include moving picture films. Considerable money has been expended on this phase of the work, and much more can be expended for it is much easier to inspire all to carry on Oral Hygiene work if we can provide them with the necessary equipment and assistance.

We have this year completed a book which is a revision of a book that is gotten out by the Oral Hygiene Committee of the Province of Ontario. This carries splendid material for lectures on Oral Hygiene. We also, now, have in preparation a book for school teachers and Normal school students, and I feel this particular phase of our work is capable of greater expansion, for there is possibly no group of young

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people preparing for their life work with whom we can carry on to greater advantage, where more splendid definite results can be obtained, than through nurses, nurses in training, and school teachers.

During the last thirty days, the Council has loaned my services to the Ontario Red Cross, to assist them in their Campaign for funds to carry on their programme.

And now for the coming year, with increased financial resources and with the added responsibility under which we are now working, i.e., with a Federal grant and a Red Cross grant, we have reached out and formed definite plans to carry on active mouth health work in different parts of the Dominion. For the Province of Saskatchewan, we are now considering a programme jointly with the Saskatchewan Dental Society for an extensive year's work, which will embrace general oral health propaganda, and the carrying of dental services to remote and sparsely settled districts, and also to provide dental services to some of the outpost hospitals.

We are starting this year with high enthusiasm, an active Committee, and additional funds, all of which gives us hope that next year's activities will be far-reaching in their scope and great benefits will be accomplished.

H. S. THOMSON.

* * *

REPORT OF THE SECRETARY.

In presenting this report, I would first like to explain that Dr. R. J. Reade, who was appointed Secretary-Treasurer at the last annual meeting, carried on the work until January of this year, when he resigned, as he found it impossible for him to continue, I was then asked to resume the Secretaryship, and at the same time an honorarium was provided which enables me to employ a stenographer to assist with the greatly increased correspondence and office work. The appointment of a sub-committee consisting of Drs. Trotter, Nasmith and myself to carry on active work between meetings of the Executive Committee, and the co-ordination of the work of the Field Officer and Secretary-Treasurer, were steps which improved the efficiency of the organization.

Since last annual meeting, your Executive have held eight meetings, and the sub-committee have held six meetings since February. The sub-committee also held a conference with delegates from the different provinces, during their attendance in Toronto at the Ontario Dental Convention in May.

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Gen. Mewburn and Mr. E. E. Reid, who have always been most helpful when called upon, came to the City last November in order to meet with the Executive in conference. Also, it might be mentioned that Dr. Trotter, Chairman of the Executive, journeyed all the way to Halifax last August, in order to give a Report to the Canadian Dental Association on the work of the Council.

The Financial Statement which I am about to read covers only actual receipts and expenditures. It does not include the grant of Five Thousand Dollars, passed by the Dominion Government, as this was not received in the period covered by the Report, nor does this include the salary of the Field Officer, as this is paid by the Canadian Oral Prophylactic Association.

STATEMENT OF RECEIPTS AND DISBURSEMENTS. (Year ending May 31st, 1927.)

RECEIPTS.

Cash on hand and in bank, June 1st, 1926	\$ 576.79
Contribution, Canadian Red Cross Association	2,500.00
Canadian Dental Research Foundation, Rent:.....	50.00
Sundry Refunds	2.65
	\$3,129.44

DISBURSEMENTS.

Secretary, on account of honorarium	\$ 300.00
Travelling Expenses	314.40
Rent	300.00
Stenographic Assistance, Stationery and Postage	96.44
Magazine Subscriptions	34.50
Meeting Expenses	62.55
Auditors' Fees (1925-26 period)	30.00
Bank Exchange	.30
	\$1,138.19
Cash in Bank, May 31st, 1927	1,991.25
	\$3,129.44

AUDITED AND APPROVED.

(Signed) Thorne, Mulholland, Howson and McPherson,
Chartered Accountants,
AUDITORS.

At the beginning of the Calendar year, the Executive drew up a plan of activities for the year, which called for an expenditure of Ten Thousand Dollars. (As explained before, the Salary of the Field Officer is not included in this amount.) About Eight Thousand Dollars have already been promised, so that the Executive feel confident the balance will be forthcoming.

EDMUND A. GRANT,
Secretary-Treasurer, Canadian Dental Hygiene Council.

Dental Health Campaign in England



THE Dental Board of the United Kingdom has produced two coloured posters, one entitled "Diet Your Teeth," emphasizing the value of proper feeding, and the other called "The Twice-a-Day Habit," urging the importance of the toothbrush. Two others printed in black-and-white, showing "How to Clean the Teeth" and "How Decay Spreads," have also been selected.

In addition, Miss Mable Lucie Attwell has, at the Board's request, designed three most artistic coloured posters for children. These are something quite new in the way of posters and should make a strong appeal to all those who are interested in child education.

The coloured posters are sold at 2s. each, and the black-and-white ones at 1s. each, while the whole set of seven posters can be had for 10s. post free. Applications enclosing a remittance should be made to the Secretary for Education, The Dental Board, 44 Hallam Street, London, W.1.

A Note on Engineering and Dentistry

W. E. CUMMER, D.D.S.,

*Professor, Dental Technology, Faculty of Dentistry,
University of Toronto.*



AS a calling, the profession of Dentistry has a peculiar attraction for many different types of mind. It is essentially a health service, with a Science and a Practice.

Within its Science, in addition to that which is purely dental in its origin and use, great elder sister professions have generously contributed, namely Medicine, Surgery, Engineering, and the calling of the Artist.

Within its Practice, in addition to that which is purely dental, and also in addition to a technology which belongs to the foregoing sister callings, the crafts of scores of callings, such as, for example, that of the jeweller, gold and silver-smith, ceramist, die sinker, moulder, sheet metal worker, have contributed generously to her various resources in technology.

A striking example of the similarity between that branch of Engineering dealing with fabricated structures, and a branch of Dentistry also dealing with fabricated structures, although at opposite poles in point of magnitude, may be observed in the following scheme.

SOME POINTS OF SIMILARITY BETWEEN THE SCIENCE AND PRACTICE OF PROSTHETIC DENTISTRY AND OF ENGINEERING, USING A PROBLEM IN ARCHITECTURE AS AN EXAMPLE OF THE LATTER.

1. PRELIMINARY.

Architecture.

(a) Preliminary survey of site, foundation available, and surroundings; and the collection and study of all facts which bear upon the requirements of the future building.

(b) Choice of general type of building.

Prosthetic Dentistry.

(a) Examination, general (if required and by physician) and oral, of the patient, and collection and study of all facts bearing upon the requirements of the future restoration.

(b) Choice of appliance, Full, Partial or Crown-Bridge restoration.

2. DESIGN.

(a) Complete set of blue-prints of the proposed building and its foundation, and occasionally a model of the proposed building.

(b) Written or printed specifications as to labour and materials.

(a) A mental picture, or actual drawing of the proposed restoration, and its foundation, often preceded by a study model.

(b) Verbal or written specifications, if the co-operation of laboratory assistants is required.

3. CONSTRUCTION.

(a) Excavation, foundation, erection, decoration and finishing of the building (using standard parts and materials).

(b) Work involved in making the building ready for occupancy.

(a) Impressions, model, bases, articulation of teeth (function and esthetics), further construction (using standard parts and materials), finishing.

(b) Insertion of denture, and work involved (as spot grinding, lapping, or rebas-ing), until the service is finished.

4. MAINTENANCE AND REPAIR.

(a) As required in the building.

(a) As required in keeping the appliance in good condition and the adjacent tissues healthy.

TWO DIFFERENCES BETWEEN THE TWO.

In addition to the difference in magnitude, prosthetic service is governed by the biological laws which apply to the living parts which co-ordinate with, or are affected in any sense by, the artificial substitutes; a condition not ordinarily present in engineering problems.

“The First Wealth is Health”

[Dr. Alex. Gemeroy, of Edmonton, presented a paper upon the subject of Diet at the recent convention of the Dental Society of Western Canada. The following report was prepared for Oral Health by Dr. Leslie McIntyre.]



OUR forefathers, though wise in many ways, entirely ignored the selection and preparation of foods in their relation to mental processes translated into subsequent action. Even at the present day, though these truths are recognized, it would require revolutionary changes in the habits of our people to accomplish the end sought. Though earnest pathologists assert that dietary errors and excesses are causes of various degenerative organic diseases of middle age, though the human race is prone to chase every new-fangled mechanical toy or device, such as the motor car and radio, yet in his eating, man is a pure ancestor worshipper. The gorging on meat, bread, potatoes and pie shows up bulging rotund figures, hidebound arteries, and kidneys and livers ready for the junk heap. Firmly fixed food fundamentalists are we.

The following few simple rules in eating are suggested:

1. Decrease (gradually) amount of food eaten, especially of bread and meat, and avoid unfriendly food combinations;
2. Eat generously of green salads twice a day;
3. Eat at least one dish of green cooked vegetables a day;
4. Minimize the use of sweets;
5. Use tea and coffee clear and unsweetened;
6. Drink six or eight glasses of water a day.

RELATION OF DIET TO DENTISTRY.

How many practising dentists have been aware of the underweight, undernourished child with those white decalcified areas on the tooth enamel? Dr. Percy Howe has been studying this from the standpoint of the vitamine theory. Little is known of the actual formulae or structure of the vitamine, but much is now known of the results when added to or subtracted from a diet, and their relation to vital processes are becoming better known all the time. Of the five vitamines, Fat Soluble A and Water Soluble C are the ones we are mostly concerned about, since our methods of rendering animal fats destroy the

value of the former to some extent, and our refining methods are apt to deprive our food of the latter.

Germ of grain and leafy vegetables are rich in vitamines but milling and storing are apt to ruin this factor. Raw milk is a splendid food, but, again, pasteurizing may remove Vitamine C. Since the average child's diet may be and often is deficient in both Vitamine A and Vitamine C, he should be encouraged to use raw vegetables, fruit grown in the open sunshine and bulky, coarser food to aid in satisfying him and removing the desire for the refined, concentrated and more dangerous foods. Since these deficiencies can be so easily remedied by simple additions to the diet, it is through the spread of this knowledge that good results may be obtained.

Cattle which are healthy but for experiment have had the Vitamine C removed from their food, show progressive involvement of the bony structure including even the tooth enamel. Dr. Howe's experiments lead him to believe that there is a relationship between the white disintegrating spot on the enamel and a deficiency in Vitamine C in the diet. Nutritional deficiency from within destroys the organic matrix or renders it unable to resist assaults from without. A corrected diet, properly balanced with the necessary Vitamine, will go far in keeping a tooth in good condition, and to better withstand disintegrant forces. The dentist will have to readjust his attitude from cleaning teeth mechanically in an endeavour to prevent decay to one of a dental physician properly equipped to advise the expectant mother as to suitable tooth-building foods or to consult with the parent in an endeavour to suitably add to a diet lacking in the necessary material to aid in saving the tooth enamel.

Dr. Gerneroy received many requests for copies of the original which showed the very great interest taken in this subject by the members of the dental profession.

TO REMOVE ROUGE.—After polishing crowns, plates, etc., I found it difficult to remove traces of rouge, and would spend much precious time fussing with a brush and soap and water trying to do so. Try a solution of bicarbonate of soda and hot water with a brush. It quickly and thoroughly removes all traces of rouge. Denatured alcohol will also work beautifully, but is more expensive.—*Dental Digest*.

The One-Track Mind

H. B. HARMON, ATLANTA, GA.



WE are somewhat accustomed to hearing criticisms of our American people by those of other countries, to the effect that we are money mad and that, in the mad race for wealth and dollars, we lose sight of and care little for the finer things of life. With the customary independence and indifference, I have in the past merely shrugged my shoulders at such and either thought or replied that this was "sour grapes."

Three experiences which I have had in the past several months, have served to change my ideas somewhat and to bring me to the realization that, like many in the business world, I was not attempting to develop the cultural side of mind and life; and that as a result, I was missing a great many of the finer things in life.

Several months ago, in company with one of our managers and his wife, I went through a local art museum in one of our largest southern cities. The collection of statuary and paintings was a good one and I enjoyed the hour or more spent there. Particularly do I recall the statue, "The Laocoon Group," a picture of which you will doubtless recall as having been in your first Latin grammar. In looking at this piece of statuary I found that I had entirely forgotten the name of it, anything of the legend in connection with it and naturally, therefore, could not truly appreciate the work. Passing on from this to the paintings, I realized that I could not identify the works of the modern artists nor did I have any understanding of certain pictures by the Masters.

As a result, I could appreciate them but little.

A few weeks later, on one of my trips, I found myself in conversation with a fellow traveller. He wore the key of a well-known honour society and at first glance I took him either for a minister or a teacher. Later he told me he was a teacher, the head of the art department in one of the largest girls' colleges in the South. He mentioned ceramics and gave me some most interesting and, I may say, almost inspired information regarding a certain kind of pottery which was made by the girls in his art department; how it afforded them the means to express their love for their native state, county,

city, or countryside in fashioning designs in this pottery. He told me of the field of ceramics and what is being done to develop this in the South to-day. Frankly, I hesitate to say just how "little" I felt in the realization of the fact that I knew practically nothing of all that he was talking about.

Some months later it was my good fortune while visiting a Branch Office to meet one of the foremost music teachers of that city and to talk with her for some time. She was a native of Norway, was educated in Berlin, Leipzig, and Paris, and had been in this country for a number of years. She spoke only broken English, but her peculiar enunciation made the conversation all the more delightful. I tried to avail myself of the opportunity of learning something about music and finding out why the American public at large does not really appreciate good music. It is impossible to go into her full explanation of the situation here other than to say I realize how little many of us think of the finer arts, of the cultural side of our natures, and how much thought and energy we put in the mad race for dollars.

The three experiences mentioned above made me realize what a one-track mind I had and how little I was doing to change or improve this. I began to realize that in order to appreciate and develop the cultural side of my life and mind it was necessary to have an understanding of these different branches of art and science; and that only with the understanding could the appreciation come. With this as a background, I determined to begin immediately and through the means of books to improve my knowledge of these things, to have some understanding of the finer things in life and thereby to appreciate them more.

My time is naturally, for the most part, spent with the offices and it was almost impossible for me to work out any definite reading course which would give me just what I wanted. When I talked the matter over with our Librarian, she volunteered to arrange the course for me and became quite enthusiastic over it. This has been worked out and the successive books are being secured from the Carnegie Library just as soon as one is returned.

The present course embraces art, paintings, sculpture, music, architecture, ceramics, philosophy, and doubtless will be extended. Thus far I have completed fifteen or twenty books along this line and I am just beginning to realize how little

I did know of these things and what a great pleasure can be derived from such reading.

I can now think back to the time when I went through perhaps the most famous art museum in the world, "The Louvre" in Paris, and what little good I actually got out of it. As I recall it there were rooms and hallways filled with pictures and statuary which impressed me, but it was only a short time before my eyes were tired and the real appreciation of these works of art was absolutely beyond me. I think this is the situation with a great many of us and I recall a little story in one of the books which I have recently read, about as follows: In one of the famous museums of the continent, some newly rich people were being conducted through the art museum by the guide and he was pointing out various pictures by the Masters and explaining something of the meanings of the pictures. One of the ladies in the group was continually criticizing each picture and finally in desperation the guide made this statement: "These pictures are not on trial; they have stood the tests of the ages, it is the people who look at them who are on trial." Their remarks regarding the pictures had already been made and it was unnecessary for the guide to say more. I wonder how many of us have been on trial in similar situations or in conversation along certain lines where we lacked any real knowledge yet attempted to either criticize or to comment.

* * *

The Bee With the Single-Track Mind

NOTHER view of the "single-track mind" is expressed in the form of a parable in a recent issue of "The Christian Century": "I have a friend who knoweth all about Bees. And as I walked abroad with him, he stopped over a Dandelion Blossom and picked up a Bee. Now this was a stunt that my father could do, but I undertake it not.

And he said, Dost thou know that the Bee, albeit a Versatile Individual of sorts, hath still a Remarkable consistency in the matter of Single-mindedness?

And I said, I know that he hath studied Geometry and hath found that a Straight Line is the shortest distance between Two Points.

And he said, That is not the full extent of the matter.

Behold this Bee, which I took from the Dandelion Blossom. Look at his Legs how they be laden with Pollen. And it is all Dandelion Pollen. When I release him, he will go to another Dandelion Blossom, and to no other. It is not true that in the improvement of each shining hour as the poet hath said, he gathereth honey all the day from every opening flower. He gathereth honey from only one sort of flower. And though there be about blossoms of an Hundred Sorts yet will he gather Honey from only one sort on any one Expedition.

And I said, I suppose he knoweth that the market is better for White Clover Honey in its season. Doubtless he doth read the Rate-sheet, and doth co-operate with the Honey Producers in keeping up the Quality of the Goods.

And he said, We are very Grateful to him for that. But that is not the extent of his knowledge. Behold this Bee, which I take out of an Apple Blossom. There is upon him no Pollen of any sort save that of the Apple.

And I said, If I were a Bee I would stick around the Apple Blossoms.

And he said, Thou canst not tempt a Bee that is out in the orchard to go from an Apple Blossom to a Plum Blossom or a Pear Blossom. He goeth straight from one Apple Blossom to another. And the Bee that beginneth with the Pear or the Plum sticketh to that same Blossom for that whole day, and it may be for more than a day. He doth never mix the Pollen.

And I said, That is an interesting fact.

And he said, Yea. And thereby is it provided that the Pollen of a flower of one Species shall be carried to a flower of the Same Species, and thus there shall be true Fertilization, and all because the Bee hath a Single-Track Mind.

And I said, I believe there is something to be said in praise of men whose minds have more than one Track.

And he said, It may be, but it would ruin the entire Vegetable Kingdom if the Bee were to take lessons from them.

And I said, It doth ruin a number of kingdoms already that men's minds are so constituted. For while the man with a Single-Track Mind hath something to fear from Head-on Collisions when he doth meet himself coming back, still, the other sort of folk run their minds off into a series of Sidetracks that never get them anywhere.

And he said, If thou art disposed to Moralize, take it for

what it is worth. But I am a Student of Bees, and what I tell thee is Straight Goods so far as they are concerned. If the lesson hath value to Mankind, see thou to it.

And that is just what I am doing."

Sixty Years of Progress in Dentistry

THERE are forty-nine faculties of dentistry in the Dominion of Canada and the United States of America, of which five are located in Canada, one being in Halifax, two in Montreal, one in Toronto and one in Edmonton. The first faculty of dentistry in the United States was that organized in Baltimore in 1840 and the first Canadian faculty that formed in Toronto in 1875.

The steady progress of dental education in Canada, during the past sixty years, is clearly revealed in the preliminary and professional requirements that have obtained from time to time during that period. The requirements in the Province of Ontario will serve to illustrate:

	<i>Year.</i>	
In	1869	the requirement was one session at a dental college.
In	1872	a special matriculation examination was held by the Dental Board.
In	1876	two sessions at Dental College were required.
In	1878	a High School Entrance Certificate was required for admission, and
in	1880	entrance was raised to High School Intermediate Certificate, and
in	1889	Latin was added.
In	1892	three sessions at Dental College were demanded.
In	1896	Junior Matriculation for entrance, and
in	1903	four sessions at Dental College were required.
Since	1921	one year pre-dental work with four years of Dentistry (equivalent to five years beyond pass Matriculation) has been compulsory, and for the ensuing year
	1927,	two years of pre-dental work and four years' Dentistry will be required for graduation. (This is equivalent to six years beyond Pass Matriculation.)

Golden Jubilee of the Eastern Ontario
Dental Association, Stanley Island,
June 22, 23 and 24, 1927

MARK G. McELHINNEY, D.D.S., OTTAWA.



HIS fiftieth annual meeting will be long remembered, not only for the number in attendance, but for the excellence of its programme and the quality of its entertainment. As would be expected upon an occasion of this kind, there was much interest shown in the history and traditions of the organization and we were indeed fortunate to have with us Dr. R. E. Sparks, the only living charter member. Many things of great interest were brought out in the informal discussion, and it was evident that the original objects of the Association had been kept well in mind and carried forward for the lasting benefit of our profession.

The professional part of the programme was exceptionally good in matter and in presentation. Dr. Lorne MacLachlin's "All Compound Technique for Mandibular Impressions" was a splendid clinic, to miss which was a loss. Dr. Coupland's "The Place of X-Ray in Diagnosis" was a clear exposition of the subject by one who knows it thoroughly. Our old friend, Dr. Nolin, is worth hearing at any time and especially so when on a subject to which he has given close attention. Dr. A. E. Webster is top-hole with the E.O.D.A. He did show us that there are factors from which it is possible to make a reasonable forecast of the chances facing the human denture. If there is anything in a subject Doctor Webster will dig it up and mill it over in a most thorough manner and without mercy. Woe unto the man who presents him with a phoney thesis. But if he is critical and a bonny fighter, he is fair and one gets a square deal. Dr. Krueger's "Dentistry a Health Service" was comprehensive and illuminating, a good antidote for extremists to swallow, for it can do so much good.

The exhibits were good, especially the Research Exhibit where the white rats, more like pets than clinical material, had continuous attention.

On the entertainment side, the Golden Jubilee Banquet stands out in high relief. The menu was in the hands of

friend Duquette, which means that it might be equalled somewhere but we do not know the address. Dr. Davidson gave his report, starting out as usual by trying to make us believe that he was no speechifier and finishing one of the nicest little orations, that anyone might be proud of. Doctor Sparks told us many interesting things of the old days, and some stories also, which showed that he had not lost his old-time sense of humour. Drs. Juvet, Webster and Smith all made good, as usual, but it was Dr. Allan Armstrong who was handed a rather hard one, that of filling in at a moment's notice the reply to the toast to the ladies. He made a remarkably good job of it.

The great speech of the evening was that of Canon Allan P. Shatford. It was splendid in its eloquence and magnificent in its spirit and must remain a high spot in the memories of its hearers. By the way, the Canon is a Bluenose and there is something in that.

We must not forget the solos by Miss Grace Ely and Dr. Archie Grace. They were highly appreciated by the audience, as was evidenced by repeated encores.

In spite of occasional showers the links were well patronized. The fishing was not very productive and the bathing notably scarce, but the Convention was a success in every way and a credit to the hard-working committee that made it possible.

“Hold the Line, Please”



WRITER in the *Business Magazine* tells of some business practices that irritate him. One is, the man who has a secretary or telephone operator call you up, with the result that you turn from your dictation or whatever you are doing, and are greeted on the telephone with these words: “Mr. Woffles calling; just a minute, please.” You wait four minutes until finally it is quite convenient for Mr. Woffles to speak to you. Sometimes it is even worse. After waiting three or four minutes with rising indignation, the voice returns: “Hold the line, please,” it says, “Mr. Woffles is speaking on another line.”

No doubt the girl at the other end of the line thinks Mr.

Woffles is the most important man in the world, and that you ought to dance attendance on him the way she does. That is not the way you feel about it. You feel that if Mr. Woffles wants to speak to you on the telephone it is his business, not yours, to do any "holding of the line" or any "waiting a minute" that is entailed by this desire of his. You may not have the least wish to speak to Mr. Woffles—he may be seeking a favour you do not wish to grant, and this way of his of getting at you and keeping you waiting certainly does not predispose you to grant him any favour whatever.

Another telephone practice very common in Toronto is for a voice to call up and ask for Mr. So-and-so. You reply that he is not in. The secretary at the other end of the line is not prepared for this unheard of emergency. "Hold the line, please," she says, and evidently departs to consult with her principal. He may be in conference and she cannot interrupt him, but must wait until he becomes aware that she is hovering about and enquires the reason. She explains that Mr. So-and-so is not in. The course of action that is to be taken is then determined upon. She returns to the phone, says "Never Mind," and rings off. But you do mind! Your time has been stolen by a total stranger, you have been kept holding the line for no result whatever, and all because the secretary at the other end of the line had not sense enough to ascertain before phoning what to do in case Mr. So-and-so should not be in.

The telephone is a great convenience, but some people use it in such a way as to make of it a great inconvenience to others.—*Editorial, Toronto Daily Star.*

The Detection of Small Cavities and Their Treatment

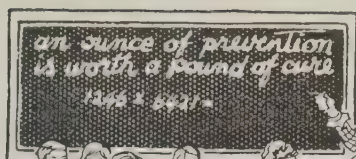
T is unnecessary to defend the dogma that all carious areas should be excavated and filled as soon as discovered. Even when these areas are discovered, it is the practice of many dentists not to fill the cavities, on the assumption that when they are very small, filling is unnecessary, and may properly be deferred. This practice is wrong. Extensive study of such cases has shown

that the extent of carious involvement cannot be determined until excavation has been performed. It has invariably been found that, in these cases, carious involvement has been much more intensive than examination has indicated. It remains only to say, on this point, that immediate filling should be performed wherever and whenever carious areas are discovered. This rule admits of no exception.

Few supplement the ordinary mouth-mirror and explorer by even drying the tooth surface, or the use of the magnifying lens. But even the use of such aids to vision leaves neglected an agency whose place cannot be taken by any other diagnostic aid, and that is the radiogram. Dentists have frequently noticed evidences of caries in radiograms taken for other purposes. Raper has brought forcibly before the profession the assistance afforded by the x-ray in detecting approximal caries. In the author's experience this method has revealed a number of cavities hitherto unsuspected, these cavities, moreover, being of considerable depth. Cavities have been opened up which, if judged by the x-rays alone, would seem to have involved only the enamel or to have extended but slightly beyond, only to find that the dentine had been deeply penetrated. An experiment frequently performed consists in excavating those cavities showing apparent caries, and then examining them again by x-rays after inserting gutta-percha in the excavated but not prepared cavity. The comparison of the two radiograms furnishes a striking corroboration of the above statement.

On the other hand the x-rays will not disclose those areas that have only slightly involved the enamel without penetrating to the dentine. This procedure has an important bearing on cases of proposed orthodontic treatment. Every case in which orthodontic bands are to be placed should be subjected to an x-ray examination for the presence of approximal caries. Failure to observe this precaution may, and frequently does, result in pulp involvement before caries is discovered. The orthodontist, if not the general practitioner, should insist on its observance for his own protection.—ALFRED WALKER, D.D.S., F.A.C.D. (*Journal of the American Dental Association*, May, 1927).

Joy in one's work is the consummate tool, without which the work may be done indeed, but without which the work will always be done slowly, clumsily, and without its finest perfectness.—PHILLIPS BROOKS.



School Dentistry

This Department is Edited by
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Director of Dental Services—Department Public Health, City Hall, Toronto.

We are anxious to receive for publication in this Department reports of work carried on in School Dental Centres anywhere in Canada. Papers on any phase of Pedodontia would also be welcome.—E.A.G.



Nativity and Preservation of Tooth Structure

A Survey of 24,000 School Children in Bridgeport, Connecticut, Showed that Race Has Little Effect on the Percentage of Cavities in Children

By **WILLIAM HALL COON, M.D.**, *Health Officer, and*
HELEN ROSENTHAL, *Supervisor, Division of Dental Hygiene, Department of Health, Bridgeport, Connecticut.*

DURING the past year, in connection with the regular and routine work of the Division of Dental Hygiene of the Department of Health, a survey was made of all children in the public and parochial schools of Bridgeport from the kindergarten to the eighth grade, to determine primarily the actual condition of the mouths of these children and if possible to ascertain what part nativity played, if any, in the preservation of tooth structure. Our survey of some 24,000 children included the careful examination by the dental hygienists of the mouth of each child and the notation of certain facts concerning its dental hygiene. The examinations of the mouths were made without the aid of an explorer and it is quite possible that cavities between the teeth may have been overlooked. The facts obtained, however, are, from the standpoint of comparison, well worth recording and noting.

SIXTEEN RACIAL GROUPS.

There were sixteen racial groups (determined by nativity of mother) each of which was over a hundred in number, the totals being as follows:

ORAL HEALTH for July, 1927

American	7,732
English	522
Austrian	227
French	178
German	338
Greek	105
Hungarian	3,304
Irish	904
Italian	5,048
Jewish	418
Lithuanian	280
Polish	2,490
Russian	1,365
Scotch	124
Slavish	2,385
Swedish	353

If the influence of heredity *per se* might be expected to influence the conditions of mouth hygiene in any one of these groups, we might expect bad mouths in one racial group and good mouths in another. What we actually found may be expressed in the number of cavities in the permanent teeth per child and in the percentages of children with no cavities. There are other figures in our report, but these two point out as well as any the importance of the facts secured. They are included in the accompanying table containing figures secured in the survey.

Nationality	Number of Children Examined	Cavities Percentage Percentage			Average Age
		in Permanent Teeth per Child	of No Permanent Cavities	of Cavities and No Fillings	
American	7,332	0.9	26.3	8.2	9.4
Austrian	227	0.9	19.6	4.3	9.5
English	522	1.0	22.	6.0	9.8
German	338	1.3	21.4	7.4	9.6
Greek	105	0.7	16.7	12.1	9.5
Hungarian	2,304	1.1	18.0	4.9	9.4
Irish	904	1.0	22.5	6.4	9.7
Italian	5,048	0.8	27.2	9.2	9.7
Jewish	418	0.6	25.8	8.9	9.5
Lithuanian	280	1.7	17.2	5.1	9.3
Polish	2,490	1.6	16.4	3.7	9.4
Russian	1,365	1.0	21.6	7.0	9.0
Scotch	124	0.9	26.4	1.3	9.2
Slavish	2,385	1.0	23.3	2.2	9.6
Swedish	353	1.1	21.3	6.6	8.9
French	178	1.4	23.5	8.3	9.4

The Bridgeport survey of sixteen racial groups, determined by the nativity of the mother, showed marked similarity in group percentage of cavities, instead of wide differences as might be expected.

It would be supposed that in making this study we might expect to find some rather material difference between the teeth of children of American and Italian parentage, taking into consideration the fact that the Italian immigrant as he comes

into this country generally has good teeth and for some time after he comes here both he and his children preserve his racial and dietary habits. But our examination shows that of the 7,732 American children examined 8.2 per cent. had no cavities and no filling in their teeth. The Italian children group shows very little difference from this figure with a percentage of 9.2. If you look at the statistics concerning the permanent teeth of these two groups you will find that the American children show 0.9 cavities in the permanent teeth per child and that the Italian children show 0.8.

In fact, as you look over the entire table you find that it is marked by similarity rather than by differences. Perhaps the most striking departure was found in the teeth of the Scottish and Slavish children; the Scottish having a percentage of 1.3 of no cavities and no fillings and the Slavish but 2.2. The best records we have, although these are for very much smaller groups, show that of the fourteen children of Swiss parentage 43.4 per cent. had no cavities and no fillings; twenty-eight children of Spanish parentage show here a percentage of 31.9, and the fifty-six American negroes of 18.6.

WHERE THE DIFFERENCE LIES.

While the figures given are for racial groups and vary only within small limits, there is a wide difference when we observe these groups in certain of the schools. In the Maplewood school the children come from well-to-do homes and in the greater number of instances the parents are financially able to have their children's teeth cared for, and perhaps the intelligence to see that this care is taken. Here, of the 1,236 children examined over 560, or over forty-five per cent., had no dental defects and of the total number examined but four per cent. had dirty teeth. In another school in a different part of the city where pupils come largely from homes in which the standards of living are distinctly lower than those in the school first named, 1,154 pupils were examined and only sixteen per cent. of the children had no dental defects and nine per cent. had dirty teeth.

COMPARISON OF COMMUNITIES.

When we had completed our survey in the Bridgeport schools this question appeared, however, as to how our results and the figures we had obtained would compare with the results of a survey of children of similar ages in a community

where no dental hygiene work had been carried on, for in Bridgeport we had been carrying on this work for ten years. Through the cooperation of the State Department of Health of Connecticut we were able to make a survey in another community where no dental work had been carried on, among 1,000 school children from the kindergarten through the eighth grade.

In this community, of the thousand children examined but two per cent. had teeth in which there were no cavities and no fillings. In Bridgeport eight per cent. of the pupils had teeth with no fillings and no cavities. In order to make more exact the comparison we compared one of the schools in the community with one of our schools in which there were approximately the same number of children and from the same class of homes. Of the 558 children examined in the community outside Bridgeport permanent cavities averaged 3.6 per child, while the 573 children in the Bridgeport school averaged 1.4 permanent cavities per child.

EIGHTH GRADE PUPILS.

Another interesting comparison was made with 123 eighth-graders in the outside community and 135 children of the same grade in a Bridgeport school. The children of this grade in the outside community averaged 5.4 permanent cavities per child as against 1.5 permanent cavities in the teeth of the Bridgeport pupils. In the outside community eighth-graders but eight per cent. had no cavities, while in Bridgeport schools forty-seven per cent. had no cavities.

It seems to us this report shows that in the preservation of tooth structure, environment and education apparently play a far more important part than does heredity.—*The Nation's Health*, May, 1927.

A Dental Research Fund



FUND of \$50,000 for dental research at Temple University, at Philadelphia, has become available through the will of Dr. Henry Isaiah Dorr, emeritus professor of anæsthesia in the school of dentistry there, according to *Science*. The income of the fund will be used to establish, equip and maintain a laboratory of dental pathology and bacteriology, with special reference to the relationship existing between these subjects and anæsthesia.

PUBLIC EDUCATION

DENTAL HEALTH

"The public has decided it wants health talk and means to get it! The lay press is the most powerful medium of instruction for the public in health matters. We must do our best to secure its co-operation!"—Sir Thomas Horder.

I N this department each month will be published short articles suitable for use in the public press. The material has been authorized by the Oral Hygiene Committee of the Ontario Dental Association, and members of the profession may feel free to arrange for its publication in the local papers or magazines.

TOOTH TURNS BLACK.



OUR white pearly teeth have perhaps excited the admiration of your friends, and your pride in them is fairly pardonable.

But one day a tooth that you had been intending to have "fixed" ceased to bother you, until by and by you noted with some little alarm that this tooth was quite dark in contrast to its fellows.

Or, perhaps, your dentist because of your neglect found it necessary to remove the pulp from a tooth, following which operation you found with some dismay that it had changed colour, and noticeably so.

Now, what has caused this?

Contrary to your idea, possibly, a tooth gets its shade, not from the outer enamel covering, which is almost colourless, but from the array of colours in the underlying body of dentine.

As a sequence to pulp death and decomposition, we have a disintegration of the blood elements with the production of pigments or colour compounds. These permeate the dentinal structure through its many little tubuli and are reflected through the almost transparent enamel, giving the tooth its shade; this is the principal source of discoloration.

A less frequent cause is from the use of remedial agents employed in tooth treatments, many of which have the property of staining the dentinal substance.

Now, unfortunately, as you can see, all of the scouring that you may do is of no avail—like the historic spot of "Macbeth"—it will not "out."

However, your dentist by employing bleaching agents within the tooth cavity can, with fair success, restore the shade, if the discoloration has not remained too long.

THE SALIVA.



YOU will recall how you came in hungry and saw Mother's cooking on the table, so tempting. And you said, "It makes my mouth water."

Now, as a matter of fact, it probably did, for the mere sight or smell of savoury food is sufficient to stimulate the salivary glands to function.

The role played by the saliva among the defensive agencies, in tooth decay, is a very important one.

We have, first, the mechanical cleansing of the teeth and mouth structures by the saliva; how important it is then, that the food be palatable to stimulate the salivary flow, and that mastication be thorough to the same end. For it is a matter of common observation, that in cases of "dry mouth" the teeth quickly crumble away through decay.

Now try this:

Chew for a few moments some starchy food,—a piece of white bread or potato. Notice, presently, how sweet it tastes. What causes this?

In the saliva there is a content known as ptyalin, which has the power of converting starch into sugar and which action takes place during the process of mastication, as the first step in the digestion of the starch element. But the ptyalin content performs the still further function of freeing the tooth surfaces of clinging pasty particles by dissolving the starch.

Then, too, you have observed how sticky or ropy is the saliva, at times. This is due to still another salivary content,—the mucus. The function of this substance is largely the mechanical one of binding the food particles together, and at the same time of lubricating and making slippery the surfaces of the teeth and mouth tissues, thus assisting in the act of swallowing.

Lastly, the presence of saliva, with its constant renewal, tends to overcome through its neutralizing effect the harmful action of fermentation of carbohydrate matter in the mouth. Hence, it is important for this reason too, that the supply be liberal.

Therefore, it is worthy of observation here, that great emotions, such as anger or fear, or the unpleasant feeling of worry and vexation, tend to greatly check the normal salivary flow, and for this reason, if for no other, during the process of mastication, the mind should be swept clean of all such disturbing tendencies.

ACID MOUTH.

“CID mouth” denotes a condition in which the saliva is acid in reaction—turning blue litmus red.

Normally, saliva resting in the mouth is neutral or very slightly acid, while saliva as it flows from the glands is but slightly alkaline.

The danger of real “acid mouth” in which the saliva exhibits a marked acid reaction is that the acid content injures tooth enamel and brings about a general weakening of tooth structure giving rise to decay.

But normally the salivary glands will not tolerate for long a marked acidity in the mouth, as they are stimulated by the very presence of the acid content to a flow of slightly alkaline saliva to neutralize it.

For example: You may eat some citrus fruit, grapefruit, or orange, and from the presence of the fruit acids the saliva in the mouth will give a marked acid reaction. But this condition will remain but a few minutes as a rule, the saliva returning shortly to neutrality or near-neutrality.

There appear to be, however, real cases of “acid month” in some individuals, and to combat this they are offered both alkaline dentifrices and pastes in which are incorporated fruit acids.

Nevertheless, exhaustive tests have proven that mouth acidity or alkalinity cannot be controlled by foreign substances for any length of time.

A real case of “acid mouth,” therefore, can only be permanently remedied by a diet that will build up the alkaline reserve of the body to combat “acid mouth.”

In general, milk, fruit and vegetables build up the alkaline reserve of the body, while eggs, meat, cereal and bread deplete it. The average diet, meat, bread, potatoes and pastry—tends towards acidosis or a depleted alkali reserve.

Hence, it is not so important whether we use this or that dentifrice, as that the tooth-brush may be habitually employed for the maintenance of a clean, healthy mouth.

We cannot be successful in anything these days if we attempt it in a half-hearted way. The battle is too severe; competition too strenuous. There is no success which is not built up of the red blood, the vital force and the compelling personality of the man behind it.



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ton.

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384 McLaren St., Ottawa.

Quebec—M. L. DONIGAN, D.D.S.,
127 Stanley St., Montreal.

PAUL GEOFFRION, D.D.S., 308
Sherbrooke Street, Montreal.

*Provincial Editors will appreciate receiving from all local societies copies of
papers, society proceedings or personal notes, for publication.*



MARITIME PROVINCE NOTES.



HE fourth annual meeting of the Western Counties
Dental Association of Nova Scotia was recently
held. A paper on "Difficult Extractions" was read
by Dr. Thos. Melanson of Yarmouth. The meet-
ing was followed by a supper at Bayside Farm.

The following officers were elected for the coming year:
President, Dr. H. O. Harding, Yarmouth; *Vice-President*,
Dr. H. L. Mitchener, Barrington Head; *Secretary-Treasurer*,
Dr. V. G. Turnbull, Digby.

The next annual meeting will be at Weymouth.



A meeting of the Cape Breton Dental Society was recently
held to elect officers and arrange for the convention of the Nova
Scotia Dental Association at Sydney on the 19-20-21 of July.

The following officers were elected: *President*, Dr. J. P.
Parker, Sydney; *Vice-President*, Dr. Howard McDonald,
Sydney Mines; *Secretary-Treasurer*, Dr. J. T. Lebbetter,
Sydney.



Four dentists in the Maritimes have had the misfortune dur-
ing the past few months of having their offices and equipment
destroyed by fire. Dr. S. G. McIsaac of Glace Bay and
Dr. H. W. Black were burnt out from fires which included
their offices; Dr. Z. I. Grono of New Waterford, from a
fire which originated in his office, and Dr. Layton of Moncton
also had his office destroyed by fire during this period.

ORAL HEALTH for July, 1927

The following have opened offices recently in the Maritimes: Dr. Callbeck and Dr. Barrett in Prince Edward Island; Drs. Eaton and Dobson in Halifax, the former in the Birks Building and the latter on Spring Garden Road; Dr. Haverstock in Westville, N.S.

* * *

QUEBEC.

MONTREAL DENTAL CLUB.



HE annual spring golf tournament of the Montreal Dental Club took place on Wednesday, June the 8th, when about forty members travelled out to the beautiful Mount Bruno Course.

A nine hole sweepstakes was played during the morning, the winner being Dr. J. S. Common. After lunch the regular eighteen hole handicap was played, the winner being Dr. J. S. Dohan.

The usual spirit of good fellowship for which the club is famous was a marked feature of the day, and all benefited from the relaxation and rest from their daily task.

—M. L. D.

* * *

MOUNT ROYAL DENTAL SOCIETY.



T the Annual Meeting of the Mount Royal Dental Society reports for the year were received, and the following officers elected for the season 1927-28:

President: Dr. I. N. Pesner, Montreal.

Secretary: Dr. L. S. Eidinger, Montreal.

* * *

SOCIETE DENTAIRE DE MONTREAL.



REGULAR meetings of the Societe Dentaire de Montreal were held April 9th, May 11th and June 13th. The speakers were Dr. J. A. Larcheveque, who gave a paper on "Acker's Technique," and Professor Lagace of the School of Fine Arts, on the "Evolution of Art."

The officers of the Societe Dentaire de Montreal for the season 1927-28 are as follows:

President, Dr. J. A. Pinault; Vice-President, Dr. J. A. Thibaudeau; Secretary, Dr. Paul Geoffrion; Assist. Secretary,

Dr. R. McKay; Treasurer, Dr. P. B. Fleury; Executive Committee, the above officers, with Dr. Jacques Lantier.

—P. G.

* * *

ONTARIO

EASTERN ONTARIO DENTAL ASSOCIATION.



THE officers of the Eastern Ontario Dental Association for 1927-28 are the following: President: Dr. S. G. McCaughey, Ottawa. Vice-Pres.: Dr. G. M. Gorrell, Morrisburg. Sec'y.-Treas.: Dr. D. C. W. Coupland, Ottawa. Programme Committee: Drs. W. C. Macartney, A. W. Grace, Ottawa; H. W. Weagant, Cornwall; R. P. Millan, Kingston, and M. J. Mulvihill, Pembroke.

The next meeting will be held in Ottawa in September, 1928.

The results of the Golf Tournament were as follows: Low gross—Dr. R. S. Robertson, Cornwall, winning the Ash-Temple cup. Low nett—Dr. W. H. Woodrow, Brockville, winning the Dental Company of Canada cup. The low gross first and second nine, low nett first and second nine, and hidden hole, carrying with them the Goldsmith Brothers' spoons, were won by Drs. W. A. Armstrong, Ottawa; J. A. Phillips, Cornwall; O. K. Gibson, Ottawa; E. H. Wickware, Smiths Falls; A. L. Walsh, acting dean of McGill Dental Faculty. Mrs. S. W. Bradley, Ottawa, and Mrs. W. H. Woodrow, Brockville, won the prizes in the Ladies' Bridge. Beautiful prizes were donated for the Golf Tournament. Cups for annual competition were presented by Ash-Temple and Dental Company of Canada, and five spoons by Goldsmith Bros.

—S. G. M.

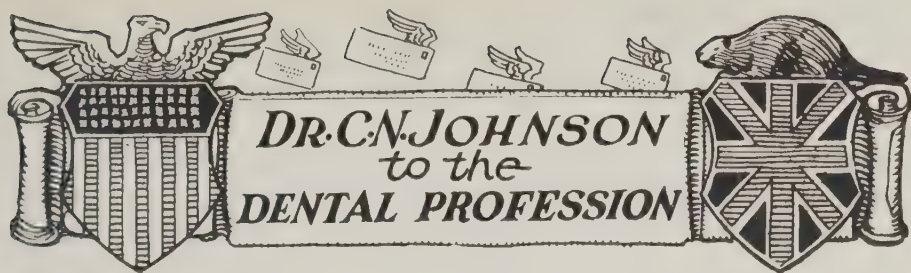
* * *

ALBERTA.

ALBERTA DENTAL ASSOCIATION.



THE election of officers of the Alberta Dental Association held in Edmonton, in May 1927, resulted as follows: President, Dr. H. L. Coursier, Wainwright; Vice-President, Dr. M. L. Moore, Medicine Hat, Sec.-Treasurer-Registrar, Dr. A. B. Mason, Tegler Bldg., Edmonton. Dr. H. V. Macaulay, of Calgary, was appointed Director for one year to fill the vacancy caused by the death of the late Dr. A. E. Hennigar.



The Supreme Lesson of Life

THERE is one lesson that should be taught to every boy and girl—in fact to every individual, young or old. It is this—that we are responsible for our every act, and that we must accept the consequences whatever they may be. We cannot commit a wrong, and lay the blame to some one else. The day of vicarious excuses for doing evil is gone forever—in truth it never existed in the minds of sane and honest men. Just the moment an individual realizes that he is to be held strictly to account for everything he does, that moment he will be more careful about committing any act of a doubtful nature.

Few men do wrong innocently. We were given our reasoning powers for the purpose of distinguishing between right and wrong. In many of the exigencies of life it is true that we may frequently find ourselves in a dilemma as to how to proceed, but never when the issue is a moral one. We may lack judgment about investing our money, or deciding on a business procedure; but we are never in doubt as to the moral rectitude of any of our acts.

Individual responsibility should be the golden text of every sermon we preach—in fact it is a whole sermon in itself. Each man should figuratively place his back against a wall, and have this issue out with himself. The question raised by Cain, "Am I my brother's keeper?" was merely the attempt to shift responsibility. It did not avail then, and it never will avail. Let us look an issue fairly in the face and accept our own obligation in the matter.

Weaved in the warp and woof of circumstance and chance we may be assailed by various influences which put to test our best resolves, but so long as reason holds her throne there is never any doubt as to which road we must take. No compromise is possible with a moral issue. A thing is either right or it is wrong, and with most situations in our lives it is perfectly clear to us which it is. Let us not hide behind the subterfuge of ignorance. Ask one hundred average individuals of responsible age as to the right or wrong of a given act, and

if they are honest with you, or with themselves, at least ninety-nine will unhesitatingly tell you. According to this most of the wrongdoing in the world is foolishly thoughtless, or deliberately wilful—it is not due to ignorance.

This profound truth should be instilled into every boy and girl the moment they are old enough to understand. It is not fair to them to neglect this lesson, any more than it would be fair to expose them to some contagious disease. But we are not treating the boys and girls of the day honourably—otherwise so many of them would not go astray. Society has drifted too far into the habit of blinking at wrongdoing. To-day the main consideration seems to be whether the wrongdoer can “get away with it”—as if forsooth it were ever possible really to escape the ultimate effects of wrongdoing.

It needs no judge or jury to pass on the rectitude of our behaviour. Courts are necessary only because of the failure of the individual and society to do their duty. This duty relates not so much to the avoidance of crime on the part of society as it does to the influence society exerts on youth. The criminal ranks would soon be decimated if they were not constantly recruited from the younger generation.

Somehow we are not taking the right measures to direct our youth, else crime would die out in one generation. What is wrong with our present formula it is not always easy to determine, but one of the fundamental faults of our system is the failure to impress on every boy and girl the lesson of individual responsibility. If we could make our young people realize that they must answer for their every act—not necessarily by process of law, but irrevocably by penalty to themselves or their friends—we would go a long way toward redeeming society. This fact should be faced that every act, good or bad, has a definite result, and even if the author of the act is successful in hiding it from the world there is no possible way by which he can escape its consequences on himself. This is fundamental, and it is the first lesson of life to learn.

Those who are charged with the rearing of children have a grave responsibility—to them it is given to conserve the most precious asset in the world. And the brightest spot on our horizon is the fact that to-day, in most things, greater intelligence is used in bringing up children than ever before. We know better how to guard their health, and to ensure them

bodies efficient for the problems of life. This is something, but it is far from being the *Ultima Thule* of our duty to childhood. Important as it is to bestow good bodies on children it is of even greater moment that we impart to them integrity of mind. The world has frequently been wondrously blessed by those of feeble body and noble mind, but no man has ever done a tangible or lasting good in the world who merely had a superb body with a mind depraved.

C. H. Johnson.

1927 Meeting American Dental Association at Detroit, October 24-28

THE following arrangements for reduced fares to members of the Dental societies of Canada attending the above meeting have been authorized. From all stations in Canadian Passenger Association, Eastern lines territory, viz.: points in Canada, east of and including Armstrong and Fort William, Ontario; good going October 15, 17, 18, 19, 22, 24, and 25, 1927, inclusive. Passengers must reach original starting point not later than midnight of November 3, 1927.

From points in the Province of British Columbia, dates of sale: October 11, 13, 14, 15, 18, 20, and 21; final return limit thirty days from date of sale.

From points in the Provinces of Alberta, Saskatchewan, Manitoba and Ontario (West of Port Arthur and Armstrong), October 15, 17, 18, 19, 22, 24, and 25; final return limit November 3, 1927. Passengers must reach original starting point not later than midnight of final return limit.

Round trip tickets requiring validation by terminal lines' agents at Detroit, Michigan, at one and one-half fare, to be sold by your local ticket agent upon surrender of Identification Certificate. Apply to Dr. D. C. Bacon, Transportation Committee, 31 North State Street, Chicago, Illinois, for Identification Certificate.

Certificates will be ready for mailing approximately thirty days before the date of the meeting.

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*Oral Health will be pleased to Receive Additions or Corrections that
Directory of Names May be Kept as Accurate as Possible.*



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ORAL HEALTH for July, 1927

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EDITORIAL

Carnegie Report on Dental Education



THE Carnegie Report on Dental Education by Professor Wm. J. Gies covers an exhaustive study extending over a period of five years. It is very comprehensive in its dealing with various phases of dental science and practice, and particularly so in the relations of dentistry to medicine. The report has just come from the press and is a 700-page volume containing much valuable information of an historical nature as well as detailed data regarding all of the dental schools on this continent. Being well arranged and adequately indexed, it will prove of permanent advantage as a work of reference. Dr. Gies' study has certainly given an impetus to dental education in all of the universities of Canada and the United States.

The several faculties of Dentistry of the Canadian universities are quite in accord with the general principles contained in the report, and particularly the requirements of two pre-

dental years. In some Canadian universities, and in many colleges in the United States, these two years are given in the Faculty of Arts, while in others a candidate is permitted to take the first pre-dental year in High School (Honour or Senior Matriculation), and the second in the Faculty of Dentistry, being the first year of the five-year dental course which leads to the degree of Doctor of Dental Surgery.

All of the Canadian schools and, with few exceptions, those in the United States, require for graduation four years beyond the pre-dental requirements, whereas the Carnegie Report suggests two years of pre-dental studies followed by three years in the Faculty of Dentistry, and, in addition, an optional fourth year for graduate study. There appears to be a general feeling throughout Canada, and in many universities in United States, including New York State, that the graduate year suggested by Dr. Gies should be compulsory as an integral part of the regular undergraduate course, making the course two-four or six years beyond Arts Matriculation.

The dental profession is under a great debt to Dr. Gies for the personal sacrifices he has made in devoting his entire time for the past five years to this study. It is expected that Dr. Gies will now resume his work as Professor of Biochemistry in Columbia University, and he may do this in the full assurance that he has well earned and will receive the sincere thanks of the dental profession for the outstanding contribution he has made to Dentistry.

Editorial Review

PRESENT STATUS OF THE PYORRHOEA PROBLEM.



PYORRHOEA is as old as recorded history. Ancient writers frequently mention "loose teeth," "shaking teeth" and "hemorrhage of the gums." There is plenty of evidence to show pyorrhœa was prevalent among the early Greeks, Phoenicians, Etruscans, Hebrews, Chinese and Romans. This is true also of the Egyptians, as can be verified by an examination of mummies. The primitive North American Indians and Eskimos were not immune, but on the other hand pyorrhœa was widespread among these races.

The people of the middle ages were also subject to this disease, and from the first century of the Christian era to modern times many references to it are made.

Nor is the disease confined to human beings. All vertebrates possessing two sets of teeth during life, the roots of which are situated in bony sockets, have pyorrhœa to a greater or lesser extent. Wild animals domesticated, and tamed animals taken out of their natural environment, suffer with this disease. Monkeys, cows, horses, sheep, dogs, cats and rats are especially prone to it.

The name pyorrhœa was first mentioned by M. Joirac, a French dentist, in 1822, and since then has been called by many other terms, a recent dental dictionary giving over fifty distinct appellations for this disease.

What is pyorrhœa? The presence of a pocket between the structures supporting the tooth and the tooth itself is the chief prerequisite for the existence of pyorrhœa. It is well known that when a pyorrhetic tooth is extracted, the flow of pus soon stops. And it is obvious that the one certainty in the extraction of the tooth is the destruction of the pocket. It follows, therefore, that the obliteration of the pocket is an absolute necessity in the elimination of pyorrhœa, and all scientific methods in the treatment of pyorrhœa must have this as a main objective.

The study of pyorrhœa from the standpoint of pocket formation has shown that there are two main types. In the first type, which is known as the simplex, the pocket is as a rule wide, shallow, and slow in development, and the tooth becomes loose relatively late in the progress of the disease. Here the causative factors are mainly superficial, such as deposits on the teeth, and the presence of any holding medium for bacteria, such as sticky foods. As a rule this type is seen where there is a lack of proper dental hygiene.

In the second type, known as the complex pyorrhœa, the pocket is as a rule narrow, deep, and fairly rapid in development, and the looseness of the tooth is relatively early in the progress of the disease. The typical pockets in this type involve one side of the tooth-root only. It is clear that here there is present a causative factor that is absent in the simplex type. This factor is traumatic occlusion. This term means that when overloaded teeth are brought together, as in the act of chewing, there is produced a condition of overstress in their suspensory membranes which attach the teeth to the bone. This

overstress sets up in the membrane a rarefying process which destroys the supporting bone, loosens the tooth, and paves the way for the rapid development of the narrow and deep pocket so characteristic of complex pyorrhœa.

It is obvious that in this type of pyorrhœa, where loosening of the tooth is marked in the early stages, the first fundamental of treatment, even taking precedence over the care of the pocket, is an adjustment of the biting relations of the teeth in such a manner that overloading is changed to normal loading and the condition of overstress thus relieved. That this is the first fundamental of treatment of the complex type of pyorrhœa is proved by the fact that correction and removal of the overstress invariably brings about a repair with consequent tightening of the tooth. Then follows the treatment of the pocket proper. Further proof is shown in the fact that pocket treatment alone in the complex type has as a rule but little influence on the tightening of the tooth in its socket. It may be said that the introduction of scientific methods for the relief of biting overstress constitutes the greatest single advance in the treatment of this form of pyorrhœa, in recent years.

Throughout the animal kingdom, we find the wearing of the tooth surfaces the normal regulator of the bite. It was of great interest to learn that in Manchuria, for hundreds of years, the natives have had a knowledge of the value of bite-adjustment as a protective measure against tooth-loosening. In their own manner, through the centuries they have evolved a method which evidently has proved itself to be effective. With a piece of jade about four inches long, called the "biting stone," the itinerant dentist patiently wears down the high cusps of the teeth and produces what the natives call an "even chop."

It was stated previously, however, that the elimination of pyorrhœa is based upon the obliteration of the pocket. Any system or method that falls short of this is inadequate. Pockets, whether of the simplex or complex pyorrhœa, have in common as a rule two main conditions which insure their persistence. In the first place, hard deposits or concretions form on the root-surface which constitutes one of the walls of the pocket. Secondly, the soft detached tissues which form the other wall are as a rule covered with tissue that has extended down into the pocket from the gums, and once formed there prevents the union of the soft tissues with the tooth. The main procedures

of pocket treatment are designed to remove both the hard deposits from the root-surface and the lining of the soft tissues, the objective being the reattachment of the soft tissues with the tooth.

The establishment of a balanced bite, restoration of contact points, reproduction of perfect tooth form, and competent and intelligent root surgery, are the essentials of treatment of pyorrhœa. Germicidal or antiseptic agents, whether in liquid form, paste or salve, have little if any value in pyorrhœa treatment, and certainly must not be placed in the pocket where they would do more harm than good. Even on the outside of the gums, at best their action is but temporary. If the fundamental causes and effects are not removed, the inevitable result is that infection soon is as evident as before. The use of the germicide, antiseptic, or stimulant, through the decrease in gum inflammation, has merely served to mask some of the symptoms, and to make more obscure the detection of the true underlying conditions of disease.

This brief review of the present status of the pyorrhœa problem summarizes in simple language some of the basic principles enunciated in the work of Doctor Harold K. Box in this field.

First District Dental Society, State of New York



THE First District Dental Society announces its third *Better Dentistry Meeting* to be held at the Hotel Pennsylvania, New York City, December 5, 6 and 7th, 1927.

In conjunction with this meeting, a dinner will be tendered Dr. William Dwight Tracy in recognition of his contribution and unselfish devotion to the profession.

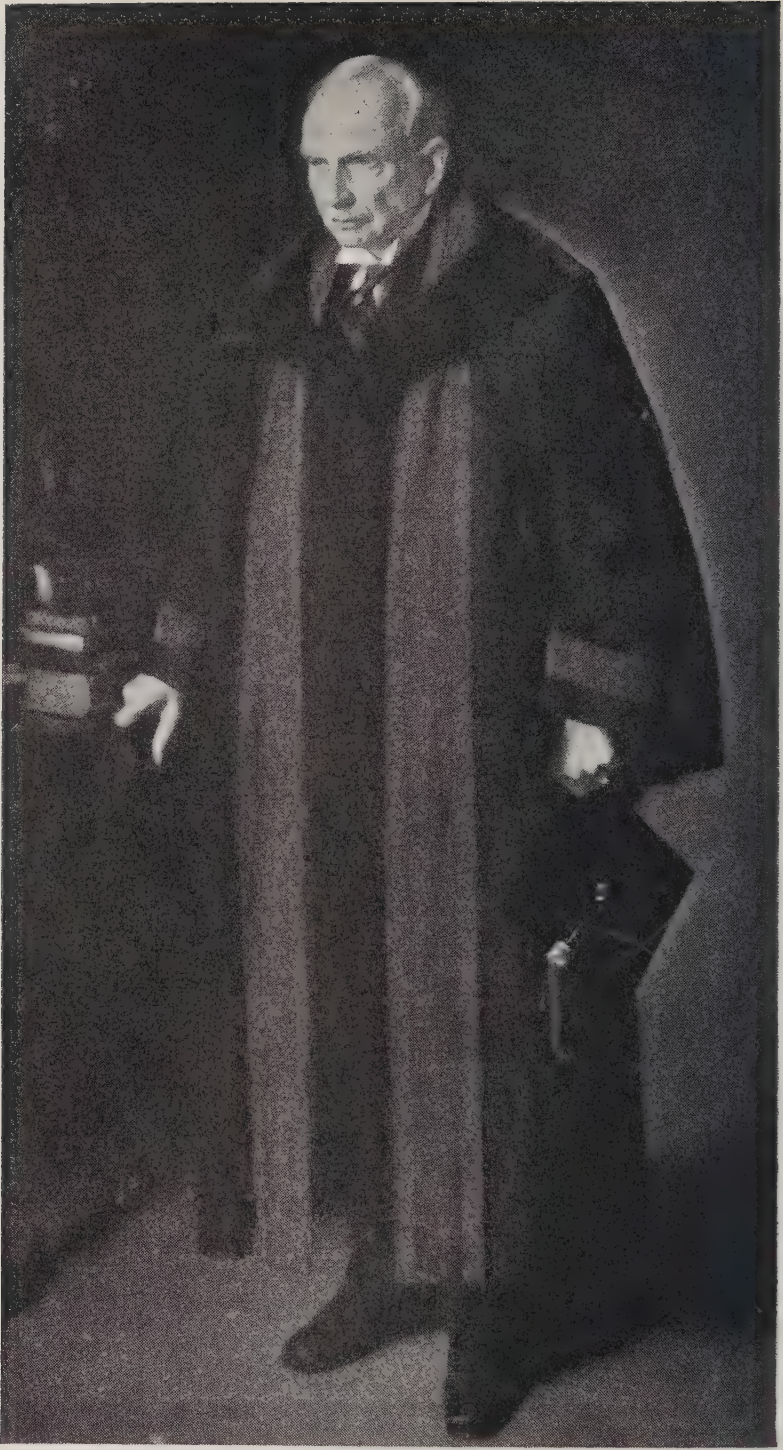
Detailed information will be published at a later date.

TO LOOSEN GLASS STOPPERS.—When a glass stopper sticks, place a little oil round at its junction with the neck of the bottle, and heat slowly in a spirit flame. The same method may be employed in the case of all-glass hypodermic syringes.—*British Dental Journal*.

Influence

HOW much may be done, is done by the brain and heart of one human being in contact with another! We are answerable for incalculable opportunities of good and evil in our daily intercourse with whom we have to deal. Every meeting, every parting, every chance greeting, and every appointed encounter are occasions open to us for which we are to account. To our children, our helpers, our friends, our acquaintances, to each and all, every day and all day long, we are distributing that which is best or worst in existence—Influence. With every word, every look, every gesture, something is given or withheld, of great importance may be to the receiver, of inestimable importance to the giver.

KEMBLE.



C. N. JOHNSON, M.A., D.D.S., F.A.C.D.
*Portrait painted by Paul Trebilcock to occupy an
honoured place in The Chicago College of Dental
Surgery.*

ORAL HEALTH

*A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION AS WELL AS THE POUND OF CURE*



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What of the Future?*

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IN this, a notable anniversary of the Ontario Dental Association, it may seem appropriate in the midst of all our felicitations, to pause a moment and project our vision somewhat toward the future. The temptation on occasions like this is, of course, to reminisce of the past, and to cast longing eyes toward that intangible but often-referred-to time, the "good old days"; but I confess that I am always more interested in the future than in the past, and I prefer to think of the possibilities ahead rather than of the achievements behind. By this I would not have it inferred that I have no interest in the history already made, or that I do not get the keenest delight in contemplation of the developments which have occurred since my association with the profession. I could speak of these developments by the hour, but I do not conceive that this would be as profitable as to consider somewhat seriously the prospects for the future, and I shall refer to the past only as it may seem to me an index of what we may expect in the days to come.

To get anything like a clear perspective of the future we must study somewhat the tendencies of the present, and we must face facts as we find them. In this view of the case I think we have much in the way of encouragement, and we have a few things which should give us pause. There never was a time in our profession when there was more *alertness* than there is now. The activity in our dental organizations was never so pronounced as it is to-day, and this may be considered a very reliable barometer of the interest we have in our

*Read before the sixtieth anniversary of the Ontario Dental Association, May, 1927.

profession, but mere activity does not necessarily mean progress. While we may marvel at the energy of a squirrel running frantically in a circular wire cage, we may well question the intrinsic value of the results. To-day we are not sufficiently in need of exercise that we must chase a rainbow to get it. The lesson we most need at the present time is how best we may direct our activities and conserve our energies that they shall net the most favourable results in a more orderly development of dentistry and a better service to the people.

In accomplishing this we have some hurdles to go over, and some rivers to swim. The way in the future, as in the past, will not all be smooth, and the sooner we recognize this the better it will be for us and for dentistry. One of the problems of the future relates to the increasing tendency toward specialization in our ranks. How this matter may be regulated and brought within its proper bounds it is difficult to determine. Of the need of specialists there can be no question. They came as a real benefaction to do well some of the things that the general practitioner did indifferently. They have refined many of the phases of practice till to-day in certain things the people are receiving better service than would have been possible without them. But there are two chief considerations in which specialization has proved a handicap to the public rather than an advantage. One is the great inconvenience experienced by patients at times in being obliged to go from office to office to secure an ordinary type of service which in the normal state of affairs should be rendered by one man. The fine line that is being drawn by specialists in some instances is illustrated by an incident which, though in all probability fictitious, at the same time represents a prevalent tendency. One man remarked to another that Dr. So-and-so was specializing on the eye. "Which eye?" asked the other. If this thing continues, we may expect to see one of our dentists announce that he is specializing on the left upper first bicuspid. To-day if there is pain in the face or jaws the patient is often pathetically driven from pillar to post, one specialist after another looking wise, charging a fee, and sending the patient to some one else. No reflection is here intended on any honest effort that is made by specialists or others to run to earth the cause of any trouble, but the tendency is becoming too pronounced on the part of our specialists to go to the extreme, on the one hand, of passing all responsibility to some one else, or on the other, to concentrate wholly on their own specialty and account for

every ill on that basis alone. The difficulty with most specialists is that they can see nothing outside their own field, and they warp every case to fit their particular specialty.

And here is the trouble with specialization; it tends to narrowness of vision, and this is one of the cardinal sins of the professional man. In the future no man should be permitted to confine himself to a specialty till he has for some time engaged in general practice, and gained a sufficiently broad perspective to enable him to look on all sides of every situation. In this way only can he give the best service to the patient, and do honour to the profession.

The lament is often made, and it is here emphasized, that the old family physician is rapidly passing away, thereby depriving people of that solicitous care which can come only from long and intimate association; and in dentistry the same thing is threatening. There is nothing sweeter in all human relationship, outside the family circle, than the affectionate understanding and solicitude developed between the professional man and the families he has served for years. Compared with this all the so-called superlative skill of the specialist sinks to miserably small proportions, and presents an altogether inadequate substitute. Let us pray for a continuance of the family physician and dentist.

One thing the future promises, and it is a very hopeful prospect. People are becoming more and more discriminating as to the kind of operations that dentists perform for them, and they are better able to judge the character of the service rendered. This must inevitably result in a greater care on the part of the operator and, which is of equal significance, a more intelligent co-operation between the patient and the practitioner. When the time shall come, as it must come, that our patients exhibit a thoroughly sympathetic and helpful attitude toward the service we render them, the practice of dentistry, while more exacting, will be more fruitful and satisfying.

In the future there must develop a better *entente cordiale* between the physician and the dentist. The nature of the service rendered by the two callings makes it imperative that the most perfect understanding obtains between the two, and happily there is a pronounced and growing tendency in this direction. More and more dentists are recognizing the great value of associations with medical men, and physicians are coming to see that in matters pertaining to the mouth and teeth

it is advantageous to take the advice of dentists. In the recent past this attitude has not always obtained. Dentists have been too much inclined to be more or less insular in their attitude, and physicians have sometimes seemed to forget that there was such a profession as dentistry. This has been manifest more particularly in the position they have taken regarding the question of focal infection in its relation to mouth conditions.

PULPLESS TEETH.

When I began this paper I pledged this audience that I had not the remotest idea that I should even mention the subject of pulpless teeth. I felt in all conscience that sufficient had been written on it for the present, and that it was the logical thing to wait developments, and let the matter be decided in the alembic of a prolonged practical experience. But a recent public utterance from a man high up in the councils of medicine has so stirred me that I cannot refrain from at least a brief reference to the subject. When a man of prominence in the medical world makes the sensational statement that a pulpless tooth is more potential for harm than a rattlesnake, and when this unfortunate statement finds its way into the public press where it is calculated to cause consternation in the minds of the people, and even among some of the less assertive in the profession, it is high time that a pronounced protest is made. There has never been in the annals of medicine or dentistry a more pointed example of aberration of mind than there has been in connection with this question of pulpless teeth. There has never been so much definite damage done to the people by any propaganda in the history of dentistry as there has by the well-organized propaganda against the pulpless tooth. Countless numbers of unfortunate people are going around to-day crippled in whole or in part for efficient mastication, and condemned for life to the handicap of an artificial makeshift, solely because of the fanatical and illogical prejudice against the natural teeth. It has almost come to a point in the minds of some professional men where they are willing to claim that nature made a terrible mistake when she grew natural teeth at all, and that it would have been a better plan to start a rubber and porcelain factory in the mouth of every babe. The length to which this onslaught on the natural organs has gone constitutes itself one of the most pathetic and poignant pictures in dental history, and it

looks as if it might be a generation before its evil effects are overcome. Even students in colleges without an iota of practical experience to give them a proper perspective are writing learnedly on the evils of the pulpless tooth, till the sane and conservative practitioner of years standing is wont to exclaim "How long, oh Lord, how long?"

No one wishes to minimize the possible evil effects of neglected pulpless teeth; no one of any sense or conscience will argue for the retention in the mouth of teeth that cannot be made healthy; but the assumption that a tooth when once pulpless is hopeless is one of the great outstanding errors of the age. Times without number it has been proved to be a fallacy, and as has frequently been stated, to assert that the average pulpless tooth cannot be made healthy by treatment is merely an acknowledgment of a therapeutic failure. It has been done so repeatedly and for so long a time that the findings of some of our recent investigators can no longer stand against more than half a century of practical experience. When I read some of the statistics that are sagely advanced against the pulpless tooth, and check them up with indisputable clinical evidence, I am impressed with the fact that about the only thing that cannot be proved by statistics is the truth.

One of the chief factors that has contributed to the continuance of the attack on pulpless teeth is not so much a matter of conviction as of convenience. To properly treat and fill a pulpless tooth is not very spectacular nor profitable. It is easier by far, and much more remunerative, to extract these teeth and insert substitutes. How much this fact is accountable for the loss of so many teeth in recent years I am not permitted to say, but I have some very pronounced suspicions.

Every man of courage and conviction in the profession owes it to the public to fight this fanaticism till it is driven into the last ditch, where it may finally be submerged and perish from the face of the earth. Then and then only may dentistry hold up its head and claim the respect of the people.

DENTAL EDUCATION.

Speaking of the students in our colleges brings up another matter with which the future must concern itself. Our dental educational institutions are undergoing a gradual evolution, and it is hoped that from this there shall develop a greatly improved order of things. But I sometimes think that in the

concentration on the various proposed plans—the one-four, the two-three, the two-four, etc.,—something very vital is being overlooked. To think of educating students solely in terms of months and years, to magnify semesters and semester hours; in other words to prescribe a hidebound curriculum, and to make it the law and the gospel to discuss little but this in our educational bodies; is to fall far short of living up to our greatest possibilities as moulders of the minds of the professional men and women of the future. It seems to be the theory of most of the men in our colleges that their primary function is to inject a given amount of knowledge into the minds of their students. They read up on their various subjects, and go to the lecture room prepared to deal out the information thus gained. They are apparently all the while concerned with the problem of pouring knowledge into the student's mind, acting on the theory that the brain of the student is a receptacle made for that purpose. It never seems to occur to them that one of the functions of the teacher is to bring something out of the student's mind as well as to put something in—in other words to compel the student to do some thinking on his own behalf. If a body of students merely learn a lot of definitions and formulæ by rote so that they can repeat them in a parrot-like fashion, they may thereby be able to pass a written examination, but they have not necessarily been compelled to think logically on any subject; and it is the ability to think and reason that really marks the man of learning. In his class work, in the laboratory, and at the chair, the student should be forced to give a reason for every statement he makes or for every technical procedure he performs. He should not be permitted to go blindly ahead and do things merely because he has seen others do them—he must know why he does them. All along the line of his college course he should be taught to use his reasoning powers, to exercise his brain. With this kind of training the student will come out of college with a mental equipment which will enable him to cope successfully with the intricate problems that are certain to confront him in every day practice, and he will thus be better prepared to meet all the emergencies of professional life.

And then to go farther and bring college teaching to its most exalted function, the instructors in our professional schools should recognize a duty they owe to students which is intrinsically of a higher order than the mere imparting of technical knowledge. It is a function that seldom seems to occur to

many of our teachers, but it is really fundamental in importance. It has to do, in addition to teaching the science and art of dentistry, with the teaching of right methods of living. It may seem like a far-fetched observation to affirm that one of the duties of a teacher in a professional school is to concern himself with the moral fibre of his students, and yet in the proper preparation of a young man to assume the obligations of a professional life the development of moral character stands supreme. And it is just as much the duty of the dental teacher to instil in the minds of his class correct ideas on living, and on ethical procedure, as it is to impart technical knowledge. Few instructors in professional schools recognize the seriousness of their obligation in this respect. These young men come to college at their most impressionable age, and are more amenable to guidance than at any other period of their professional lives. A dental school which ignores its prerogative in this particular is not only overlooking a golden opportunity to do a most constructive service to humanity, but is actually open to a charge of being culpably derelict in duty. The proper education of a professional man means that he shall be prepared in the best possible manner to serve humanity after graduation and no man is really prepared unless there have been interwoven in his education those principles of morality and right living which form the basis of true professional manhood. A man may have all the brilliancy imaginable and yet be a veritable whited sepulchre, and no man of this type has ever been known to be permanently successful as a dentist.

It goes without saying that the teacher in a professional school should never be pedantic, prosaic, or preachy. In his attempts to point his students to better modes of life he must not be continually moralizing with them. Nothing is more fatal to the influence of a teacher with a class than to be all the while pouring out doleful sermons to them; but he can at opportune moments, and in an apparently incidental way, point many a concrete lesson of the value of correct living, and the fundamental foolishness of evil living. And it may be said in this connection that the most effective manner of impressing a class with the value of moral rectitude is by way of example. Let the teacher live the right kind of a life day in and out, and he will not need to say very much to the students about correct living. Intuitively a class of boys imbibe character or the lack of it from their teachers in their

daily intercourse with them, and this adds to the sacredness of the obligation which every dental teacher owes to his calling.

Thus the future of dentistry will demand of all those who are charged with the education of our students a new vision, and a new dedication to the responsibilities involved. They must think of themselves not only as instructors in technical knowledge, but as exemplars of correct living, and they must not permit themselves to accept a position as teacher in a dental school unless they get this vision and are willing to live up to this requirement.

FULL DENTURE WORK.

One of the things most urgently in need of attention in the immediate future is that of full denture work. When we consider the great number of teeth that are lost through unavoidable means, and add to this the increasingly great number that are unnecessarily lost, we must reckon with very many edentulous mouths; and the responsibility of acceptably restoring these mouths by artificial means is squarely up to the profession. Much meritorious work has been done on the subject of full denture construction, and many able minds have devoted their best energies to it; but the simple fact is that to-day there is more confusion regarding the principles of full denture prosthesis than with any other department of dentistry. Some of the greatest men in this specialty differ so diametrically that the general practitioner is driven into a dilemma and is left at sea without compass or rudder. Frankly and bluntly, up to this time very little of a fundamental nature has been definitely settled, and with equal frankness we may say in all seriousness that one of the reasons for this is that too many men connected with the development of full denture work have been more concerned with proving their pet theories than they have with reasoning out principles. An honest clash of intellect is conducive to the settlement of any great problem, but a dogged determination to cling to one's own particular prejudices, as has so frequently been apparent in this work, has never settled anything of moment, and it never will. There are so many bright minds connected with this specialty that the only thing necessary is for the leaders to get together in a whole-hearted way, and approach the problem with an eye single to its solution, rather than to cling tenaciously, as they have in the past, to their preconceived notions, and their individual preferences. All it needs is breadth of vision, and a magnanimous acceptance of the truth when it is pre-

sented. Will not our leaders concentrate themselves to this task on behalf of a long-suffering profession and public?

PREVENTION.

With all the differences of opinion existing on such subjects as pulpless teeth, full denture work, and other matters of dispute in dentistry, it would seem to be a difficult task to bring the profession into unanimity or belief on these various topics; but there is one subject on which we may confidently expect that the profession will agree to a man. The prevention of disease is the ultimate goal toward which we are all willing to march in regular order. It is the keynote in medicine and dentistry, and much is being accomplished in this direction. Medicine has achieved greater triumphs in prevention than has dentistry, and it is a pleasure to pay her this tribute. Yellow fever, smallpox, diphtheria, typhoid fever, diabetes—those terrible scourges of generations past—have all been brought under subjection; and if people die from them to-day it is either because they do not chance to have access to the preventive measures, or are too stiff-necked and wilful to take advantage of them. The average tenure of human life has been greatly lengthened, and we are under deep obligation to medicine for this outstanding accomplishment.

And what shall we say of dentistry? By no means need we hang our heads when the charge is made that we have not yet succeeded in preventing dental disease. Surely we have not been asleep, and surely the efforts of our investigators have not all been in vain. It must be remembered that in dealing with dental decay we are encountering the most prevalent of all human diseases. More people are afflicted with dental caries than with any other known ailment, and it becomes so rampant at times as to be really devastating. We have no simple problem to solve. As yet we cannot inject a serum and prevent decay of the teeth as can be done with other diseases. Many years ago I ventured the opinion in an editorial utterance that the time might come when we should vaccinate for dental caries, and of course I was properly laughed at—as I deserved to be with the existing lack of knowledge of serum therapy. The only solace I had was a personal remark made to me by the late Dr. G. V. Black, who said: "Never mind, you may not be so very astray, after all." And yet while almost countless days have come and gone since then we seem no nearer to preventing dental caries by a serum than we were at that time.

What advancement has been made has come through a different source—through better regulation of diet, through better attention to mouth hygiene, through educating the people as to the necessity of taking better care of the mouth, and through other tentative measures. Because up to this time all our efforts have been more or less tentative, and experimental, for the very simple reason that we do not yet know what is the really significant factor in dental caries. We know that an acid causes the destruction of the tooth tissue, and we also know that this acid is produced in the process of bacterial propagation, life and death, but that is all we know. We cannot tell why it is that in some mouths these bacteria bring about decay while in others they do not; because they may be found in all mouths. There is some determining factor which we do not yet understand, and I have the conviction that until we learn what this factor is we shall never prevent dental decay. And let it be understood that this factor is not associated with the tooth tissue itself, as some would lead us to believe. Whatever the factor may be, it is certainly environmental—it is an influence working from without instead of from within the tooth. The manifestations of dental decay when studied in the mouth year after year go to prove conclusively the truth of this statement, and it is only on this basis that we may ever hope to successfully combat the disease.

Time will not permit a further discussion of this question on the present occasion, but I would not leave this audience hopeless regarding the ultimate control of dental decay. That it will be controlled I have a firm conviction, even though to-day I may not be able to point the way. I have such sublime faith in the sincerity and devotion to duty of my professional colleagues that I know full well they will work out a solution of this problem, as they have of others.

And I am inspired when I picture what may be done in the future for the benefit of my fellowman; when I look longingly at the star of hope and try to read the scroll of promise across the heavens of the western sky. My mundane vision may be dimmed and dull, but in fancy I think I see the dawning of a better day; and in that day the deeds of men stand out in bold relief against the failures of the past; and hope is high, and prospects fair, and courage unconfined.

I cannot tell, I do not know, what the future holds within its virile grasp. I cannot look beyond the heights and see the rising sun of science and of art. I cannot sweep the wide

expanse of ocean's rhythmic roll, nor see the freight in all the ships that saunter in on every heaving tide. 'Tis not for me to tell to-day what technique triumphs loom upon the future's vast domain, nor weave the wizard warp and woof of all the days to come.

I cannot tell what finger-craft may do for dental art—what genius hides within its folds beyond our human ken. Nor do I know, nor can I see, nor may I even guess what magic means to check disease lie fruitful just beyond.

But this I know, and this I feel, that somehow, somewhere, soon or late, the cries of pain must cease, and little children, poor and rich, shall grow, and thrive, and smile. And drear disease shall meet its doom, and health and joy abound; and o'er the earth the sun shall shine on hamlet and on home. And hearts of men shall larger grow, and happiness abide; when you and I and all the rest shall welcome in the dawn, and see the glories of the east sweep back the fogs of doubt; and fear is banished from our minds, and hope and cheer are ours. And in that time—that blessed time—when science marries art, and love shall take the place of hate, and greed give way to grace; we'll leave the welter of the past, and smiling through our tears, we'll beckon in a brighter day for every child of man.

THE RUSTING OF INSTRUMENTS.—In a recent issue of the *Dental Cosmos*, Mr. Walter S. Crowell discusses some of the reasons why instruments rust when sterilized by boiling, and how the tendency to rust may be minimized. He summarizes his remarks as follows:—

“The chief cause of the rusting of dental instruments is sterilization. Rusting can be minimized by:—

1. Cleaning the instruments before sterilization.
2. Adding to the water in the sterilizer one teaspoonful of soda and one teaspoonful of 30 per cent. NaNO_2 solution per quart.
3. Removing the instruments from the sterilizer *at once* and wiping them dry.
4. Draining the sterilizer at least once a day and thoroughly cleaning it.
5. Storing the instruments under cover in a dry place.

Nickel-plating can be expected to protect instruments against the conditions of ordinary storage and handling but not against the more powerful corroding action of sterilization.”

A Broader Vision of Bridgework*

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It is doubtful if many dentists comprehend how old this branch of dentistry is. To most of us it is considered of rather recent origin—probably a practice of little over half a century. Ancient historical records confirm the belief that dental bridgework was used to replace missing teeth previous to the Christian era. The writings of the Romans bear testimony that this classical race had a pride in their personal appearance and replaced lost teeth by the method of bridgework. It is believed that these people gained their knowledge of this work from the Greeks, the latter acquiring it from the Egyptians. To substantiate this belief specimens of dental work of this character have been found in the jaws of mummies buried about 500 B.C. The teeth used to substitute missing teeth were made of different materials, such as stone, ivory, bone, natural teeth and even wood. Whatever the material chosen from which they were made, the artificial teeth were crudely assembled and attached by gold or silver bands or wire to the natural teeth, thus introducing or pioneering the way to present day bridgework. The Etruscans showed evidence of familiarity with a broader knowledge of the requirements of bridgework, for history relates that both fixed and removable bridgework were used as early as 600 B.C. Mediæval history has little, if anything, relative to this work and it might appear that dentistry left no historical record in this age. Early in the eighteenth century dental literature records the use of “pivot teeth” attached to roots, but the revival of the ancient practice was not noted until a century later—in the early part of the nineteenth century—and this time credit is given to the French. The work throughout all these ages is believed to be the work of craftsmen. It was crudely constructed and bore no evidence that it was the product of a scientific mind. The people’s idea of the esthetic must, however, be observed. They apparently made little demand for anything practical or of a stable character. It was not until after the middle of the nineteenth century, and especially the latter part of it, that the

* Read before the Ontario Dental Society meeting, May, 1927.

beginning of modern bridgework was definitely recognized. Since that time, and particularly with the advancement of dental science, modern bridgework has developed rapidly and has become an important branch of dentistry.

Previous to the present century dental bridgework was, to a large extent, a mechanical art. Many of the scientific phases, so much regarded to-day for the welfare of the teeth themselves, as well as their supporting tissues, received little, if any, consideration. Craftsmanship played the major role. As time went on the profession became more enlightened in such subjects as histology, physiology and pathology, which had its marked effects upon the practice of bridgework. Advancement in the scientific field of dentistry rapidly contradicted methods that a short time before had been extensively used and were considered imperative. It was not unlike the advent of many new undertakings in their experimental stage. A lack of knowledge of any subject that has to do with the health of the human race is of serious importance. Added to this, especially in the early days of dental bridgework, this rather new practice of supplying missing teeth "without plates" opened a field for the commercial and unscrupulous mind which worked a disaster that is too often apparent in the beginning of new methods. Abuses arose that had their train of havoc, and it was not until scientific knowledge stamped itself forcibly upon the profession that many of the evils connected with this practice were eliminated.

Supplying lost teeth by means of bridgework met with such favour that the technical aspect of it received more consideration and attention in its development than other phases of the subject which were thought of minor importance. There was little realization of the significance of vital pulps in natural teeth, gingival areas free from irritation and other deleterious influences on the structures involved in the use of a bridge. Technical principles dominated all others. Devitalization of teeth to support bridges was then advocated as good practice. Bands on these same teeth for the purpose of stability in attachments were considered necessary and no serious injury to the surrounding tissues of natural teeth was thought to follow their use. Even the placing of porcelain and metal roots well into the sockets of newly extracted teeth appealed to many enthusiasts and was employed in this manner in practice. It was plainly evident that the structural features of bridgework superseded the scientific requirements of the adjacent struc-

tures, and it was not until a broader knowledge of this subject was acquired that many of these methods were modified.

A survey and a study of the technical side of bridgework from its earliest days to the beginning of the present century will forcibly impress one with the rapid progress and the skilful application made in this work. Scientific enlightenment was slowly and steadily furthering its development until it was recognized, where indicated and properly constructed, as an indispensable method for the replacement of missing teeth. In spite of all the advancement this work had made in modern times it was not until the introduction of the casting process that it met with the greatest development. This process introduced a new era in prosthetic dentistry. Its possibilities were broadened in a manner never before thought practical, and, as the curtain raised on the dental horizon it opened a vision of length and breadth in new methods in dental operations that before were clouded in obscurity. In the technical field of bridgework the casting process completely revolutionized former methods. Its possibilities were almost without limitation in this branch of dentistry. Not that this process changed the basic principles of bridgework, but it solved problems that had previously been obstacles to progress. It was the key that opened the portals to greater achievements in dental bridgework and since its adoption a broader range of service to the patient has more generally resulted. The process of casting offers us such astounding facilities for accuracy of adaptation, wider opportunities for obtaining anatomical form and contour, the use of metals most suitable for their requirements, for simplicity and definiteness of technique, together with a broader scope of possibilities in each individual case, that it cannot be denied to be the greatest benefactor in the practice of bridgework that has yet been experienced. It was particularly fortunate that this method was introduced a short time previous to the denunciation of pulpless teeth, for the casting process made it possible to construct attachments to vital teeth, as well as minimize mutilation of tooth substance that would have jeopardized the life of vital pulps in the supporting teeth for dental bridges. It guarded the blow to bridgework that, without its advantages, would have proven serious to its practice.

With all the advantages gained for bridgework by the casting process, together with that acquired in early years, this practice seemed to enjoy a place in dentistry secure from criticism, and its satisfactory service to patients requiring it was

fully assured, provided indications and construction were correct. All seemed well until the dawning of the day that sounded the alarm of focal infection in and about the roots of natural teeth. This was not only confined to pulpless teeth, but to infection within the gingival area and all other centres that in any way afforded portals of entry for infection to supporting tissues. It is doubtful if anything had ever, previous to the discovery of focal infection, disorganized the methods of practice in dentistry in the manner this subject has. Some of the changes were of a progressive sort, but the good done seemed at times to be discounted by the mistakes that were committed. Where good judgment was exercised and more regard was given to the importance of mouth hygiene, effort was stimulated to higher achievements and a broader view taken of bridge practice.

The teaching of devitalizing pulps of teeth previous to making an attachment for a dental bridge is well within the memory of almost all dentists. Where a gold crown was to serve in this capacity devitalization was considered imperative for the correct preparation for its reception. This is distinct evidence of a lack of knowledge at that time of the importance of vital pulps. This procedure today, with few exceptions, would be severely criticised, and correctly so. The casting process has afforded us means for the accomplishment of the same purpose without injury to the pulpal tissue and it is now rarely necessary to cause the loss of pulps of teeth to be used for this purpose. But many of the teeth to be employed for the supporting structure of a bridge are already pulpless. Are we to use these or extract them? This has been a much debated question, and one upon which the profession has been divided. Experience over a number of years in practice is best able to answer. Where the roots of these teeth have been reasonably well treated and filled, they have, and will, serve the patient long and comfortably in this capacity. Many years of satisfactory service to its host have provided the proof of the truth of this statement. The boast is made by some prominent in the practice of dentistry that they have not used a pulpless tooth for even the insertion of a simple inlay filling. Here misfortune lies with the patient rather than commendation with the operator. In spite of the fact that well filled roots render admirable service in bridgework, unnecessary devitalization of pulps in the supporting teeth for a bridge

is not to be recommended. Their conservation at all times should be desired.

Equally important is the consideration for non-irritation of gingival tissues. This does not mean that supporting teeth can never be successfully banded, for experience again proves the contrary. It must be done according to hygienic requirements. The most damaging results from the terror of focal infection were the extensive extraction of useful teeth, thus making replacement more comprehensive and difficult. If a full realization of this had been possessed by the advocates of focal infection, and if these lost dental organs had been possessed by them, less ravages to human mouths would have taken place. But unfortunately restoration of these cases fell to the lot of others. To meet all these conditions, and at the same time obey the new order of things, led to many changes in the methods of bridge construction. The condemnation Hunter pronounced upon the gold crown shook the faith of both dentists and laymen in its use. While his criticism was not a just one, it was readily accepted by many of the medical profession and their patients were warned against its use. His censure had to be disproven or other methods adopted. Satisfactory use of the gold crown, where properly constructed, has disqualified his statement and the casting process has limited the use of banded crowns. It was an attack upon a principle, where technique may have been entirely at fault. Nevertheless, coming from the source of authority it did, it was misapplied and was responsible for an injustice to a useful procedure in the practice of bridgework that was injurious in its results. Where indicated and properly constructed there is no form of attachment superior to that afforded by the gold crown.

Advanced scientific knowledge had begun to make itself felt on the practice of bridgework. It was quite a new thought, for previous to this time the technical part of this work was the principal consideration. In fact, it startled the minds of practitioners and many different views were taken of the practicability of the fixed dental bridge; while in truth the influences that were being exerted were but a refining process. It was being purged of much of its faulty application and construction, while its principle remained unharmed. But, as is true with the history of similar experiences, the tried and proven was by many irrational minds wholly and unconditionally condemned as a practical means of supplying missing

teeth. This was specifically directed at fixed bridgework then extensively used. It was a time rife in change and unrest in dental practice and bridgework was an attractive field of adventure. Fixed bridgework was thought to have outlived its usefulness and removable bridgework was heralded by some as the ideal method to pursue. Balance and poise in matters pertaining to dental affairs were lost, for a time, and many new ideas were promulgated with positive assurance of success whether or not they had been sufficiently tried. The same was true of the revival of old and discarded practices in modified forms. Much of this irrationalism found its growth in the younger and inexperienced minds, and, solely because it was new, had a forcible psychological effect upon the patient. This was distinctly true of, and applicable to, the removable bridge. If fixed bridgework were to receive its final condemnation, and its use to be discontinued, never was there a more opportune time than this for its enemies to pronounce sentence. This was probably the severest test that ever was or ever will be applied to the practice of fixed bridgework. For a time its survival was in the balance, but, as is usual, time was the deciding factor, for it permitted irrationalism to go beyond the pale of reason in claims for the universal adoption of removable bridgework in practice; its advocates defeating the arrival of their own objective. Inexperience and a lack of farsightedness defeated their efforts. Men of long standing authority upon this subject voiced the dangers of such irrationalism and their warnings acted as the ballast that righted the ship in distress. If not recognized fully now, in time to come the name of Hart J. Goslee will stand out prominently for the good done in this particular work at this time. The influences of his writings and teachings have always been for rational methods in dentistry and a debt of gratitude is due him for the stability he gave the practice of fixed bridgework during these threatening times.

The loss of a single natural tooth, normally erupted in its place in either arch, is a distinct loss to any individual and there is no repair that fully compensates the misfortune, and this misfortune is in proportion to the number of teeth missing. Repair should be begun soon after the extraction of teeth, particularly if it should be of the first permanent molars or permanent cuspids of young patients. In fact, it is imperative if correct occlusion, dimension of arches, and facial expression are to be maintained. In cases where the replacement of the

missing teeth is not too great a strain for the supporting teeth, the restoration can, usually, be best accomplished by means of a fixed bridge, properly constructed. That the ordinary sized fixed bridge inhibits tooth movement in function is not well founded. Even in cases of larger fixed bridges than wisdom would indicate, it would be impossible to obtain complete fixation of the supporting teeth on account of the character of the structure in which these teeth are placed. It is to be remembered that extensive fixed bridgework is not here recommended. Nor is it true that a supporting tooth ordinarily used in fixed bridgework is not able to endure the additional stress required of the bridge. According to recognized histologists the tissues, in particular the peridental membrane, will favourably react to increased stress provided it is within reasonable limitation. The peridental tissue is endowed with certain characteristics and functions that enable it to develop a specialized tissue that is designed to do an extra amount of work, and this is known as adaptive hypertrophy. This undoubtedly accounts for the thickened membrane shown in radiograms of the roots of supporting teeth for bridges. This thickening of membrane is a normal reaction to increased stress and movement and it is not akin to that caused by infection within the gingival space. It, in a large measure, explains the long and successful service of a well constructed bridge. This specialized tissue is easily injured and difficult of repair, particularly as it becomes attached to the periosteum and gum tissue and it is here the fixed type of bridge aids in its protection while the removable type offers a source of irritation. The tissue surrounding natural teeth is definitely designed to receive the occlusal force placed upon the cusps and crowns of teeth and the periosteum was not intended to bear the stress conveyed by saddles used in removable bridge construction. In regard to the supporting teeth of a fixed or a removable bridge, scientific principles support the use of the fixed bridge rather than the removable. In replacing missing teeth by any form of bridgework the chief aim should be to obtain maximum efficiency in the restoration of function and to obtain this with the least injury to the supporting natural teeth. More efficiency is to be expected where stability is greatest, which is undoubtedly afforded by the use of the fixed type of bridge. The opportunity to reproduce anatomical form offering a protection to the surrounding tissue involved in bridge construction is greater in the fixed type than in the removable. The mutila-

tion of natural tooth substance of supporting teeth necessary to receive the modern form of attachment for removable work is greater than that required for the attachment of a fixed bridge. The mechanism involving the frictional part of certain attachments commonly used in modern removable work is such as to frequently demand repair and adjustment, since all metal to be employed in this manner must suffer a lost resiliency known as fatigue of metals. The great advantage claimed for the removable bridge, and which at first appealed so favourably to patients, is that it lends itself so conveniently to cleanliness and sanitation. The belief that the fixed bridge is not conducive to the proper sanitation is due entirely to faulty construction. A careful observation over a long period of time has borne proof that a well constructed fixed bridge, in the mouths of patients possessed of clean habits, will present as clean surfaces of the teeth forming the bridge as will be observed on the remaining natural teeth. Its censure in this respect came from poorly fitted bands, overhanging inlays, indifferently constructed pontics and a general lack of anatomical form and contour in the various parts forming the bridge. The removable bridge has, however, a definite place in dental practice and it is where the stress to be carried is beyond the tolerance of the supporting teeth for a fixed bridge. It begins where the fixed bridgework ends. Where the replacement of lost tissue in addition to missing teeth is required, no other form of restoration offers the advantages possessed by the removable bridge. It is then an intermediary between fixed bridgework and partial dentures, and this is its proper place in prosthetic dentistry. It will render a definite and useful service to patients, when properly constructed.

If we are to give a maximum service in this branch of dentistry it is highly important that we have knowledge and experience in all the different methods of replacing lost teeth, for without these we cannot hope to accomplish the greatest good. A broad view of the whole field is essential to success. Each case is a law unto itself and it calls for discrimination and good judgment. To claim that all cases coming to us for treatment can be best cared for by the use of any one method is retrogression rather than progression. It is turning a deaf ear to the "knock" of opportunity, and this is not in accordance with the rapid advancement of dentistry to-day. A keen foresight of the requirements of each case, together with sound judgment in the selection of the method to be used,

are the first and most important requisites for success. In recent years it is interesting to note the rapidity with which new practices have arisen in dentistry, and without discrimination and good judgment confusion and discouragement must result.

It is acknowledged that much good has been done for patients by the use of bridgework, and yet those of us who have employed it have fallen far short of accomplishing all we might have done with it. It is depressing to see the mouths of patients more or less advanced in life who have some years previously suffered the loss of one or more teeth without anything being done, early, to replace the loss. Function has been impaired, but equally important and more difficult of restoration is the damage done to one or both arches by reason of the space that has been lost, the malposition of teeth on either side of the one extracted, the elongation of the opposing teeth, together with a loss of character in facial expression. This is particularly true in case of loss of any of the first permanent molars. Where the second bicuspid and second molar are fully erupted some means of maintaining the space should immediately be employed and a well constructed fixed bridge will best serve this purpose. To delay bridging when required for young patients is analogous to the old mistaken idea that gold foil fillings should not be inserted in the teeth of young patients. The failure to recognize the importance of early restoration has done serious injury to a vast number of human dentitions. The old prophesy that the second and third molars would assume increased responsibility and fully replace the missing molar never came true. It is my firm belief that the loss of the first permanent molar, and particularly the lower, without early replacement, has been accountable for more injury to the human mouth than any other one misfortune that has befallen it. Early treatment of these cases by bridgework is imperative and no ordinary responsibility rests with us if we neglect to use it.

Malposition of the remaining teeth following the removal of any of the first permanent molars is a common sequence, and this is true, only to a less degree probably, when teeth other than the first molar are lost. Where these spaces have been bridged it has been common procedure to use teeth that were to be the supports for the bridge as they were found—migrated, inclined, or in brief, malposed. Where these conditions have existed for any time there is usually some disturb-

ance to the health of the surrounding tissues and, if not already present, it is only a matter of time until a pathological condition arises. To demand increased labour of such a tooth by employing it in bridge construction without first bringing it into proper alignment is not good practice. Especially in the younger class of patients, correction of the position of deranged teeth should be accomplished previously to inserting a bridge. To do this embraces some knowledge of orthodontia or the co-operation of an orthodontist, and here I wish to pay my respects to the members of that specialty for the interest they have manifested in this part of our work. The simpler cases of malposition come within the field of the general practitioner and should be cared for by him, particularly where the movement of but a single tooth is involved. If the case demands extensive treatment it is worthy of the care of the specialist. When the position of the teeth has been corrected prior to bridging, it results in the restoration of their normal function and occlusion, a better position to withstand stress, improved hygienic conditions, and obtaining the original dimensions of the arch. Intrusion of the elongated teeth opposing the space, provided this is not marked, and the patient is young, should be made while the other teeth are being moved to their correct positions. If intrusion is too great, a partial grinding away and polishing the cusps may suffice, and it may be necessary where elongation is well advanced to cut away a portion of the occlusal surface and insert an inlay, properly carved, for cusp restoration. Whatever means are employed, this elongation must be corrected if proper occlusion and function are to be had. The bridge then serves as a retaining device as well as a useful means of replacement.

Effort to correct the positions of teeth to be used as supports for bridges in the mouths of patients advanced in years, and where there is a marked loss of teeth, is contra-indicated. The conditions found in such mouths that have existed over a considerable period of time are well defined. There is always impaired function. There is usually stress imposed on an inclined tooth or teeth. Elongation of teeth is present. A marked decrease from the normal sized arch prevails. Faulty habits and movements in mastication are established, together with a general lack of sanitation. Delayed treatment is responsible for such conditions, and these ulterior forces, exerted over a long period of time, make restoration extensive and difficult. The mistake is too commonly made of endeavouring

to supply bridges to spaces regardless of a plan for a complete rebuilding of the two arches. When done otherwise no good results. Provision must first be made for the establishment of a permanent and a definite occlusion in the posterior mouth. After the posterior restoration has been securely made the anterior work, whether operative or prosthetic, can then be done. It is a waste of effort to attempt anterior replacement, or even extensive operative work, and neglect posterior restoration, which is so frequently observed. The patient's value of anterior teeth is always greater than that of the posterior and this may account for this unwise procedure in so many instances. The maintenance of good occlusion in the posterior mouth is to be at all times essential, even if for no other purpose than to prevent abrasion of the anterior teeth, for just as soon as the posterior contact of the arches is lost undue injury by wear and trauma ensue. It must always be remembered that the bicuspid, and particularly the molars, are designed to do a work never intended for other teeth. These cases cannot be viewed from any one aspect, and if a broad view of restoration is required in any part of dentistry it is in the building of the two dental arches in these extensive cases of reconstruction to the form and usefulness originally possessed by that individual. This usually involves many methods and types of work and we should follow nature's plan in its accomplishment. A full consideration of cases where the loss of teeth has been extensive and treatment has been delayed is a lengthy topic in itself and time affords but a reference to it. It can be said, however, that the successful restoration of such cases offers much of vital interest in dental practice.

Since it has been requested that the discussion of this subject at this time is to be confined to the indications for bridges, rather than their construction, apologies for a brief reference to the structural feature of bridgework are here made. While no one part of any successfully made structure supersedes any other part in importance, the attachments for bridgework, whether fixed or removable, are vital considerations. Too often dentists have been enslaved to the use of one or a few types of attachments. The broad use of all the different forms and types is to be considered and employed if all requirements are to be successfully met. No greater charge has been laid against the use of bridges than that of mutilation of natural tooth substance of the supporting teeth before or after their employment. That this is a justifiable claim against

bridgework in certain instances cannot be denied. With equal honesty, it can be said that where any just claims of this nature are made, either lack of skill or good judgment, or both, are at fault, and these must be held accountable rather than the principle. Teeth are not usually lost without first being invaded by ravages of caries, and this invariably spreads to the adjacent teeth and on the surfaces adjacent to the spaces. In these teeth cavities or fillings are usually found, the latter many times in need of repair. Here the inlay, specially constructed for an attachment for a bridge, is distinctly indicated and by its use affords a dual purpose,—an attachment to a supporting tooth and a restoration of the individual tooth to prevent further decay. In such a case a bridge can be constructed, leaving the supporting teeth in a better condition than they formerly were, with the additional advantage of an attachment for a bridge. It might cause surprise if records were made, how frequently such conditions arise. The point to be made is, that conditions should be accepted as we find them and we should employ the form of attachment that meets these conditions, instead of making each tooth fit a type that is popular with the operator. In other words, why construct a so-called “three-quarter crown” to a tooth in which there is a cavity or a filling in the surface adjacent to the space? In teeth free from defects employ attachments that will produce minimum destruction of tooth tissue and irritation to surrounding tissues, with a maximum strength for the work they are intended to do. Personal equation plays a strong part in all branches of dentistry. Certain operators become so skilful in certain operations that they become enthusiasts and advocate that method to the exclusion of all others. All operators cannot do all operations with equal skill and this should be recognized. There is a definite place for each type of attachment and their choice must be wisely made for the individual case. Before concluding this phase of the subject, it should be said that a well developed skill and judgment are necessary to success, and without these bridgework will not render us, or our patients, the full measure of satisfaction that otherwise might have been enjoyed.

It has been my earnest endeavour throughout the entire discussion of this subject to impress upon you the forces that have made themselves felt upon the practice of bridgework, from the earliest times to the present, with the object that we should at all times so employ the dental bridge that its

application is made in the light of all the knowledge that we have to-day. With a regard for the time allotted me, much of importance has been left without even a reference. It is with the hope that what has been presented will inspire a broader vision of this work to the end that there is a better understanding of conditions following the loss of teeth, together with a better understanding of their replacement.

Interdependence of All Vocations

*Extract from paper by Nicholas Murray Butler, LL.D.,
President Columbia University, in the Medical
Journal and Record.*



ONE of the things which it is increasingly necessary to do in our intellectual life is to break down the traditional barriers between intellectual occupations and activities, to make it clear that they are not separate and distinct and, as many think, conflicting, but that they are interdependent, closely associated, and overlapping. The very same physics and chemistry and biology that serve medicine serve what are called the pure and applied sciences and the general interests of men. The time has gone by when we can draw a line between some of these conventional divisions of knowledge. We are no longer able to say where physics ends and where chemistry begins, where medicine ends and some of the other scientific interests and activities of men begin.

We are finding increasingly the common denominator in the intellectual and social life of men, and one of the chief problems before our generation, as it will doubtless be before the generation next to come, is of discovering and emphasizing that common denominator and bringing scientific, philanthropic, educational institutional workers of every kind into recognition of the existence of that ground and base which is common to them all.

When you come into our modern movement, you begin to find that out of this common basis of knowledge, of interest, and of service, we are realizing and recognizing a greatly increased interdependence among them all. The process of bringing that interdependence into view, of making it clear and effective, has only just begun. Presumably it will go on for a long time, perhaps for a generation or two, before it is accomplished, but that it is going on seems to me perfectly certain.

Present Day Surgical and Therapeutic Practice in the Treatment of Periodontoclasia*

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PERIODONTOCLASIA means a breaking down of the investing or supporting tissues of the teeth. The name is an excellent one, because that is exactly what the disease is, a break in health of these structures. Health may be defined as a condition in which the cells, tissues, and organs are in proper function. Note the three elements involved—cells, tissues, and organs. In other words, periodontoclasia means that somewhere in the cells, tissues, and organs of the masticatory apparatus there are failures in function. Treatment must be directed to discovering the cause of these failures in function of cells, tissues, or organs, and in eliminating the causes, in other words, re-establishing proper function. With such a conception in mind it is easy to see why treatment of this disease in the past has been so unsatisfactory. If the dentist has but one idea as to the cause of the disease his treatment will be correspondingly inadequate. Some improvement may follow from the treatment of any single factor, because the cells, tissues, and organs all have some reserve power and are able to function if given half a chance. Removal of one morbid factor may be enough to tip the scale toward improvement. But in most cases no lasting benefit results from such treatment. Periodontal attachments, weakened by pocket formation and bone loss, are at such a disadvantage because of mechanical leverage that the best of treatments is none too good to insure future health. Every possible factor causing or tending to cause disease must be discovered and eliminated.

The causes of failure in function of cells are, first, insufficient blood supply; second, a lack of certain necessary food constituents in the blood; third, the presence of toxins or poisonous constituents in the blood; fourth, the accumulation of waste products around the cell; and fifth, the presence of

*Read before the sixtieth anniversary of the Ontario Dental Association, May, 1927.

injurious agents about the cell, such as bacteria or mechanical or chemical irritation. A faulty blood supply may be a systemic condition, but usually it is local. In many individuals the periodontal tissues are thin and frail, because of lack of use during the developmental period. Tissues and organs grow and develop largely depending on their blood supply, which, in turn, depends on the exercise or use of the tissue and organ. Heavy bone develops depending on the stresses on it, heavy ridges for powerful muscle attachments, heavy alveolar process for vigorously used teeth. The gingival tissues are cushions to protect the periodontal or supporting tissues from the injuries of masticating coarse food. These tissues are kept in vigorous circulation by the massage which such food vigorously chewed brings to bear on them. The pericementum is a ligament wonderfully constructed to give elasticity to the tooth and to resist the movements to which it is subjected. Its health depends on its circulation of blood, which, in turn, depends on the usage which the tooth gets. Injurious stress may cause degenerative changes to occur in which the blood vessels partially close, as shown by Box. Or teeth may shift together from loss of contact and the gingival periodontal tissues between shrink away by pressure atrophy. Or the presence of bacteria against the tissue and penetrating into it may cause inflammatory changes leading to faulty circulation. Whatever the cause of faulty circulation, whether developmental failure, lack of use, excessive stress, atrophic changes or inflammation, the first essential in the treatment of periodontoclasia is to establish a vigorous circulation in the periodontal tissues. For the most part this is done by gingival massage and by training of the patient in proper masticatory function. Where injurious stresses occur these must be relieved temporarily by grinding, pending the re-establishment of function to the masticatory machine as a whole.

The second cause of failure in cell function is faulty food supply to the cells. The periodontal cells are no different from other cells in the body in their needs. They differ only in that they are constantly in the presence of bacteria whose effort is to penetrate and grow in the tissue. It is the function of bacteria to break down organic tissue, while it is a function of tissue cells to withstand them. There is more or less infection at the base of practically all gingival crevices, as shown by Gottlieb; in other words, a constant struggle is occurring between the invading micro-organisms and the tissue cells. Be-

cause of this any disability to the tissue cells of the body on account of faults in nutrition or metabolism is shown more quickly in the gingival periodontal tissues than anywhere else in the body. Lowered resistance leads immediately to increased gingival invasion by bacteria with resulting symptoms of inflammation. Because any dietetic or metabolic error reflects itself more quickly in these tissues than any other, the dentist should be the first one to note a break in systemic cell resistance, to inquire into it, and to take steps for its correction. The common errors in diet are due to excessive eating especially of protein food, insufficient indigestible bulk or residue, insufficient calcium, insufficient fat soluble vitamins and insufficient antiscorbutic vitamin. It is absolutely necessary in the thorough treatment of any case of periodontoclasia to know that the diet is adequate. Since the average physician is just as ignorant of the needs of the body from a nutritional standpoint as the dentist, there is little to be gained by referring patients to ordinary physicians for dietetic advice. The dentist must train himself to determine dietary faults and to correct them. Fortunately it is not as difficult as it sounds. The good work of Dean Seccombe here in preparing his tables of foods and his daily diet charts has made it possible for the dentist or dental assistant with comparatively little training to determine without an excessive expenditure of time just where the diet errs from the normal and proper. The only criticism to be offered of the table is that the vitamin values of the foods listed are not given. This is, however, not so serious as it sounds, for if the diet contains considerable butter and leafy vegetables it is probably adequate in fat soluble vitamins, while if it contains considerable fresh raw leafy vegetables and acid fruits like oranges or tomatoes it is undoubtedly adequate in the antiscorbutic. If these food elements are not abundant in the diet it is inadequate.

Armed with the study of dietary errors of the patient it is possible to help greatly in the control and treatment of periodontoclasia, but more than that, in the prevention or relief of many other symptoms of faulty bodily function which, if unrelieved, would soon lead to incapacity, invalidism and premature death. The dentist is a most important factor in health service, because he gets the cases when physical breakdown is just beginning. If he is able to function by analysing and correcting the dietary errors which bring so many people to an untimely grave, he will increase his service to humanity by

many fold. Disease of the periodontal tissues is one of the first symptoms of nutritional defect. The dentist must recognize nutritional defects always as a possible cause of periodontoclasia, and his treatment must be devoted to ascertaining and correcting it just as certainly as any other cause.

A third reason for faulty cell function is the presence in the blood of products which are injurious to tissue cells. Excessive sugar in the blood in diabetes, uric acid, in nephritis, mercury poisoning, cancer or other systemic disease all have their depressing effect on the periodontal tissues and increase bacterial invasion in them. In many cases local treatment is fruitless of results because of worry or some of these systemic diseases which prevent recovery by the tissue cells. It is necessary to know that the cells are not being poisoned in these ways. For this purpose the physician proves much more valuable, although ever here he may let most important facts escape him. It is not uncommon to have patients whose health is completely broken from constipation who have been in the hands of even eminent physicians for years without effort made at correction. The dentist must study dietetics and the rules of hygiene until he can direct his patients. Physicians as a group are far behind the dentists in their knowledge and thinking in prevention. The dentist must find out himself about constipation and must be able to direct its correction. By means of dietary changes, including reduction of food to body requirements, great increase in the proportion of cellulose containing foods, attention to regular body habits, abundant use of water before meals and properly regulated exercise, there are few cases that cannot be helped without drugs or oils. For the discovery and correction of diabetes, nephritis, syphilis, and other such diseases a physical examination by a physician is necessary and should be performed as a routine in cases of marked periodontoclasia. Much can be learned by the dentist from the patient by intelligent questioning regarding systemic conditions, but wherever possible this should be supplemented by an adequate physical examination by a physician.

The fourth cause of faulty cell and tissue function of the periodontal tissues is the presence of bacteria or of mechanical or chemical irritants in contact with them. It is in this field that the periodontists have done their best work. The removal of bacteria and calculus from the teeth, the delicate shaving of the cementum surface, the repair of faulty contacts which allowed food to impinge and remain, the removal of rough

edges of enamel, fillings or crowns, have been dealt with by Carr and many others many years back. Yet it is necessary to re-emphasize the need for perfection in technique in this work. Unless calculus is removed completely from the root surface the adjacent soft tissues will not heal, more calculus will form and the disease process will progress.

At present there are two schools of thought in the local treatment of the periodontal tissues. The one depends on exquisite accuracy of technique to remove all subgingival calculus, and to shave the cementum just to a polish and no more. By adequate home care the teeth are kept free from masses of bacteria, and the gingival tissues are massaged, by which the circulation is restored, the surrounding connective tissues tighten and bind the gingiva to the root and a healthy epithelium lines the pocket. The epithelium may attach itself to the cementum, thus obliterating the pocket. Some shrinkage of the gingiva occurs, but not much.

The second school believes that it is better to remove the diseased gingival flap to a point where a normally deep gingival crevice can remain. There are three methods of getting this result. The first consists of a frank resection of the gingiva. Under a local anæsthetic the depth of the gingival crevice is ascertained and the gingiva resected to that level by means of properly shaped knives and tissue forceps. If borders of alveolar bone stick up they are ground off slightly below the level of the soft tissue. The raw shelf of gingiva may be left uncovered to heal or it may be superficially cauterized with silver nitrate and covered with paraffin for a few days. When healing occurs new tissue heaps up around the tooth for a considerable distance to re-establish a gingival crevice. This new tissue is vigorous and free from infection, and leaves a very healthy result. It has to be watched, however, as points of granulation tissue tend to form, which interfere with a smooth result. These must be cauterized away as they occur. There are two scientific objections to the method. The first is that it leaves more root surface bare than is necessary by other methods, and second that it is unnecessarily uncomfortable to the patient. To many patients the raw surface and edge of bone are agonizingly painful for many days and the complete treatment of the mouth is a distinct drain on their vitality.

The second method of getting rid of the diseased gingival flap is the Berger operation. Under local anæsthesia the inter-

dental gingiva is cut over an area and the labial or buccal gingiva stripped down, exposing the roots and alveolar bone. With curets the rarefied bone edge is smoothed and all granulation tissue masses are curetted out. The gingiva is then laid back, trimmed wherever necessary and stitched into place, thus obliterating all gingival flaps. The method has an advantage over the resection method in that no raw surface is left uncovered and is comparatively painless. It is even more drastic in tissue removal, however, as tissue is removed to the bone level—a point way below where regeneration could be expected to occur. And the heaping up of tissue seen after the resection operation, by which a considerable restoration of the resected tissue occurs, can not be expected following the Berger operation.

The third type of removal of the gingival flap depends on pressure atrophy. The pocket is packed by a loose rope of cotton in which an antiseptic cement is incorporated, such as Tempo cement, Carbol Eugenol, or Sterident. It is tucked to the base of the pocket with a thin, flat burnisher and the pocket filled around the tooth until the gingiva is mildly blanched. This is left for twenty-four hours and removed, after which medicated paraffin wax is inserted to where blanching just begins again. The wax is retained by forcing it between the teeth and flattening it on the lingual side. This treatment is repeated and about the fourth day the gingiva turns out and new tissue grows up from the base of the crevice. It may now be left to shrink down by itself to a new line about the root. In all these methods calculus is scaled from the roots at the time when the roots are exposed to direct vision. The value of the pocket packing method lies in the freedom from raw cut surfaces and in its painlessness, and also in the considerable rebuilding of gingival tissue. Of the three methods of removing gingival tissue where it is necessary this method appeals to me the most.

A periclasial pocket is a crevice lined on one side by cementum, the outer surface of which contains necrotic connective tissue, fibre ends, and by calculus, that is rough masses of calcareous matter containing innumerable bacteria. The gingival side of the pocket is covered by degenerated epithelium broken here and there, underneath which is a granulomatous mass. By means of apoxesis, that is, the fine scaling and root surface finishing, followed by home care and massage, the root surface is left in so polished a condition, so free from

bacteria, that the tissues can lie against the root without irritation. The massage restores circulation so that bacteria in the tissue are eliminated and the gingival flap becomes healthy and may even reattach to the root, as shown by McCall and Box histologically and by many periodontists clinically. By this means the maximum amount of root covering is retained.

The cementum is extremely thin in the cervical portion of the root and very little shaving is necessary. If the cementum is as thick as an ordinary human hair, as shown by Box, one tenth of this shaved away is enough. Too deep shaving cuts through the cementum into the very porous outer portion of dentin, leaving a sensitive root surface which is never free from bacterial growth. Shaving to the point where the cementum feels like polished ivory when examined with a No. 18 explorer is the proper amount. The further the pocket extends toward the apex the less possible is it to leave the cementum like this, for the cementum toward the apex and in the bifurcations is very cellular and it is impossible in many cases to prepare a polished surface. To get to the bottom of all pockets, to scale off all calculus perfectly and to leave a polished cementum throughout is a very nice technique. Outside of the few who devote themselves almost exclusively to it, probably very few dentists do it adequately. It is a matter of educating the fingers to distinguish between the sensations encountered as the scaler or explorer passes over the root surface. Many large instrument sets are on the market for the work, but an elaborate set is really unnecessary. Good work is being done with many different kinds of instruments and a good operator can usually do everything possible with a dozen to twenty carefully chosen instruments.

It is not possible to render all root surfaces free of irritation to the surrounding tissues. Teeth vary in their structure and a set of teeth will occasionally be encountered in which it is impossible to get the cementum polished. Absorption areas in the root will sometimes be involved in the pockets. And no one is one hundred per cent accurate in removing calculus without cutting through the cementum. For all these reasons areas will be found where pockets do not heal. The gingival flap refuses to reattach or even to bind tightly against the root. Such pockets should be packed until the gingiva has receded to a point where it can remain bound tightly on the root.

The role of the epithelium in the gingival crevice is coming in for much study lately. As the tooth erupts and comes in

contact with the oral epithelium a downward growth of oral epithelium occurs toward the amelo cemental junction. The epithelial cells lying against the enamel gradually hornify and remain attached to the enamel after eruption as Nasmyth's membrane. This hornified membrane was formerly thought to come from the enamel organ, but it is now known that the last vestiges of the enamel organ become calcified on the periphery of the enamel rods and are thus invisible in ordinary tooth sections because decalcified away with the enamel. This idea that the oral epithelium lying against the enamel or cementum forms a hornified layer which glues itself to the tooth surface and remains on the tooth surface as a permanent structure is due to the work of Gottlieb and his students. It explains a number of points in periodontia. As age advances the epithelium grows down along the cementum. The base of the gingival crevice is normally a constantly advancing line. Shortly after eruption it is high on the enamel—later it advances to the amelo cemental junction and in old age it is down on the cementum. It remains no longer at the amelo cemental junction than at any other point. What causes the epithelium to advance down the cementum followed by an advancing line of base of the crevice and gradual recession of the gingiva is at present unknown. It may be the irritating effect of the mild inflammation found at the base of the crevice in practically all mouths and teeth.

In periodontoclasia there is usually a great extension of the epithelium along the cementum, whether or not pocket formation keeps up with it. Periclasial pockets are lined to the base with epithelium, with only here and there a break where the connective tissue comes to the surface. Apoxesis leaves a deep crevice lined with epithelium and the only attachment that can occur is that of the epithelium gluing itself to the tooth surface with a thin layer of horn. Thus we can not expect a new attachment of connective tissue fibre into the cementum formerly involved in a pocket, nor can we expect the bony crest to grow up further than the point where pericementum ends and the epithelial attachment begins.

To overcome this difficulty of having a layer of epithelium interposed between the cementum and the connective tissue of the gingiva which might conceivably attach itself to the cementum as normal pericementum were the epithelium not in the way, Dr. J. O. McCall has attempted to destroy the epithelium lining the pocket by means of sodium sulphite.

This solution is used as the active principle of most depilatories because of its softening effect on keratin of hair or skin. After scaling the subgingival calculus and shaving the root surface the pocket is flooded with sodium sulphite solution, allowed to stand a minute, and then curetted gently on the gingival surface to peel out all the disintegrated epithelium. Whether this will prove to be of real value I am not yet ready to say. So far there is very little evidence in former periclasial pockets of reattachment of normal pericementum by means of new layers of cementum laid on by cementoblasts, this being the method by which such reattachment must occur. In one case shown histologically by Box, in which the connective tissue lies in contact with the cementum where formerly a periclasial pocket existed, the fibres run along the root, not into it. The connective tissue apparently forms a capsule, not an insertion. There is therefore very little reason to think that in pockets of some standing, where the cementum can be none other than dead, a reattachment of pericementum can be made to occur. If the pericementum is destroyed half way down the tooth it may be possible to obliterate the remaining pockets, but from the standpoint of support the root has lost half of its attachment for all time.

Teeth in which the attachment is lost all around more than half way to the apex should be extracted at once. So should teeth on which pockets extend to the apex of the root. Experience shows that the teeth which have such extremely deep pockets practically never can be kept in health. Similarly loose teeth on which apical absorption has occurred should be extracted. Much can be done in the treatment of periodontoclasia on teeth in which the disease has not advanced too far, but there are limitations. Since the knowledge about focal infection has required that no chronic inflammatory focus be left deep around the dental structures, periodontists are taking less chances than formerly with doubtful teeth.

In this discussion so far one very large factor has remained untouched. That is the subject of traumatic occlusion. Traumatic occlusion means a break in function of the masticatory machine. The jaws and teeth, with attached muscles and ligaments, are a wonderfully constructed machine for their purpose. The mechanical arrangement of the structures under normal conditions is a joy to the engineer who examines them. But unfortunately in the present day and generation of soft devitalized food, racial intermixture, etc., the majority of

masticatory machines are not normal and many are not functioning at all. Fortunately the tissues adjust to developmental faults and usually compensations occur which maintain health. Thus, with no other factors operating, a simple irregularity of the teeth, even though pronounced, would not lead to traumatic occlusion or to periodontoclasia. Most of the traumatic occlusion comes from one of two things; first, a changing relation of the teeth to each other, and second, some vicious mouth habit. When teeth are extracted the other teeth shift, the jaws settle together and certain teeth become locked. The lines of force on the teeth are no longer in line with the long axes of the teeth and lateral stresses occur. Teeth subjected to such occlusal trauma develop degenerative and circulatory changes in the pericementum, gingiva and alveolar process which are profound. Occasionally teeth will be found in which there is very great mobility, possibly with apical absorption, because of it yet with no pocket formation. Usually infection causes deep pockets in such damaged periodontal tissue.

The treatment for traumatic occlusion is not grinding, except as a very temporary relief. Grinding may relieve the locking, but it does not restore the mechanical balance necessary for normal function. Experience with grinding shows that first one tooth and then another shows the effect of occlusal trauma. There have to be frequent treatments and the end results are not satisfactory. When teeth are subjected to occlusal trauma the periodontal tissues become damaged and it is necessary, if the teeth are to be saved, that the mechanical relationships be brought nearly to the ideal. Mechanical faults occurring during the developmental period which were compensated for before periodontoclasia occurred can no longer be tolerated because of the weakened bony support to the teeth. The ideal relationship is one in which the occlusal surfaces of the teeth are so adjusted to each other that within the normal range of masticatory excursion all the teeth remain in contact with their antagonists all the time. It is what is known in prosthodontia as balanced occlusion. If the bite is closed it must be opened in order to bring the force of occlusion in line with the axes of most of the teeth, in order to give proper tension to the tissues of face and throat, in order to bring the condyle of the mandible away from the tympanic plate and thus relieve deafness, and in order to give room for the tongue and make swallowing and salivary drainage of the mouth normal.

In order to bring a mouth in which many teeth are loosened, many shifted in their positions, several lost and the bite closed with the mandible retruded, to anything approaching an ideal mechanical relation, is a problem in reconstruction and orthodontia. The steps in the process consist of making accurate models of the teeth and setting them up on an anatomical articulator by means of face bow and check bites. For this work the Monson anatomical articulator and method are the most satisfactory. A model of the reconstruction work is then built in clay or wax on the plaster models which can serve as a guide in the reconstruction of the case. If the bite must be opened considerably and the mandible shifted forward it is better to do this by means of splints, that is, metal castings of the occlusal surfaces cemented over the lower molars and bicuspid and so designed as to open the bite the proper amount and to force the mandible to the desired position in order to be comfortable. If much change is needed it can be accomplished in several stages so that at no time must the patient adjust to a position so different from the habitual one as to cause discomfort. When the patient is habituated to the new position the permanent restoration can be built in. Orthodontia is coming to be used more and more for these cases. In many instances it is the only means by which a tooth may be adjusted so that it can be brought into function with the force directed along its long axis. Many times a simple expansion of the arch by tipping up lower teeth having lingual inclination is all that is needed to open the bite sufficiently for all purposes. Furthermore, such orthodontia for adults with broken down mouths can be done and is being done successfully at the present time by many operators.

There are several factors which limit very considerably what can be done in building up to a balanced relationship and proper spacing of the jaws. One of these is the increased leverage which is put upon the teeth when they are built up. Many cases will require an occlusal extension of nearly a quarter of an inch on certain teeth. If half the bony support is lost on such a tooth this extension to the crown means a great increase in the force which lateral masticatory movements bring on the alveolar crests. In the second place, an opening of the bite to a near end to end relationship of the anterior teeth would frequently cause a very bad esthetic result. The bite should never be opened further than the point of most perfect facial proportion. Thirdly, patients cannot become accus-

tomed to too great a change in relationship. Permanent restorations should not be inserted until the patient is adjusted on the metal splint. It is very easy to overdo this work and render patients permanently uncomfortable. Fourthly, many patients have nervous habits with their jaws which must be recognized and taken into account. If jaw relations are so changed that these habits cannot be performed they are permanently uncomfortable. A compromise must be made between what the patient is used to and ideal mechanical relations.

The results of such reconstruction work are most gratifying. The effects on digestion, on hearing, on nervousness, of a closed bite and locked occlusion, besides those on the periodontal tissues, are much more serious than most dentists have any idea of. The relief which comes of building up to proper jaw relations and balanced occlusion is correspondingly great. But even the most enthusiastic advocates of this work admit that it is easy to go too far with it. They all have cases in which they wish they had not opened so far.

In my opinion the restoration orthodontia method is the one to use in cases of traumatic occlusion. By it a mechanically ideal, or at least greatly improved mechanical condition, can result which reduces the stresses on the teeth to the minimum. This cannot be done by grinding, which only relieves one tooth by increasing the strain on others. When the bite is closed by loss of teeth or occlusal wear a mechanical fault is present which interferes with function and can only be corrected by opening and establishing favourable mechanical conditions.

Occlusal trauma is frequently induced by vicious occlusal habits. Locking the jaws at night, grinding the teeth at night, locking and unlocking the jaws continuously throughout the day, biting far out on some interfering cusp, thread biting, and many others lead to destruction of the periodontium on the affected teeth. The treatment of these conditions is difficult and it must be handled according to the condition and patient. Some habits the patient can correct by effort. Others must be corrected by mechanical interference. The difficulty usually is to discover the habit that is causing the trouble.

To sum up, the treatment of periodontoclasia is a matter of finding the causes of faulty function in the cells, tissues, and organs of the masticatory apparatus and of eliminating these causes. The circulation must be rendered vigorous through these tissues by brush and finger massage and by thorough

mastication of coarse food; the systemic causes of low cell vitality must be corrected by regulating the diet, elimination, and other hygienic factors and by correcting any systemic disease; the root surfaces must be rendered practically bacteria free by accurate scaling of all calculus and polishing of the root surface; the mouth must be made and kept sanitary by eliminating edges and crevices for bacterial lodgment and by regular, accurate home care; gingival flaps that cannot be made to attach to or hug the root surface should be removed by pocket packing or by resection; and the masticatory apparatus should be restored to support tipped teeth, to close open contacts, to give proper jaw relationships and to give as perfectly balanced occlusion as possible under the limiting conditions incidental to the case.

I want to voice a protest against the superstitious acceptance by dentists of therapeutic agents for which there is no rational basis. It may be possible that Mercitan or ultra-violet rays or Inava vaccine do help the tissues to rid themselves of bacteria when everything else is done. Our chief recourse for this is to raise systemic resistance throughout and to stimulate circulation by massage. Perhaps some of these agents will help in this work. Certainly ultra-violet therapy is helpful in allaying after-pain after resection. But unless the dentist knows what he is dealing with, has a diagnosis by which all the causes of faulty function in the periodontal cells and tissues and in the masticatory machine itself are discovered, and then proceeds to eliminate these causes one by one and place all parts in the most ideal function possible, he is simply treating symptoms and not the disease itself. The expectation that the injections of Inava vaccine or applications of ultra-violet light or Mercitan are going to cure periodontoclasia in a patient on a faulty diet, who is constipated, perhaps has diabetes, has never really chewed his food, nor cared adequately for his mouth, and whose teeth are shifted about, the bite partly closed and with deep pockets and subgingival calculus about all teeth, is absolutely ridiculous. Nor is the expectation of accomplishing the result by surgical resection much better. We as dentists must get a broader outlook and more fundamental understanding, so that we are not taken in by every novel fad or patent medicine vender that comes along with a string of testimonials. We are health service workers in the field of dentistry. We must think of our work as restoring and maintaining health in the mouth, with all that this involves. This is a long step

from the conception of the average dentist who is thinking in terms of giving treatments of one kind or another for pyorrhœa at so much per treatment or of making restorations at so much per filling. There is more to dentistry than most of us ever dream of. A dentist with the proper vision of his service and with a convincing personality could take the patients from the average dentist after they are supposedly completed and find and do more necessary work for them than their dentist ever did in the first place. The work is there to be done, the patients need the service if they are to save their teeth and their health, and they are willing and desire to have it done when they understand the need. Let us arise to our opportunities in dentistry.

For the Motorist



IN a recent issue of "The Telegram" speed was described as an economic waste, the only advantage gained being the passing thrill. The article pointed to the fact that the man who maintains a steady pace at a safe speed gets home only a minute or two later than the speed fiend. He has missed the great thrill of passing up the snails, of feeling the wind whizzing by his ears, of turning the necks of traffic cops.

But the "plodder" has gained in the knowledge that he's driving safely. He has gained economically by conserving his gasoline and putting no undue strain on the car. For it is well known that mileage goes up under a steady speed and that the motor car lasts longer when no strenuous demands are made of it.

Furthermore, the steady driver has gained morally in maintaining the good-will of his fellow motorists and in not being sworn or cursed at.

The greatest good goes to the motoring and walking public for steady driving is safe driving, whereby lives and property aren't endangered.

There would be little to regret if a sudden spurt of speed in a city street were disastrous to the driver responsible for it. But it usually is the innocent pedestrian or nearby motorist who gets its ill effects.

The speed demon is an economic waste to himself and the public.

Impacted Wisdom Teeth

J. TELLIER.



THE author explained how he had come to read a paper on this subject: he had just seen a patient who, having been to a dental practitioner for the extraction of a wisdom tooth, and after several ineffectual attempts had been made and the tooth finally broken, had gone home in a fright. A radiogram was passed round showing the fractured tooth. Another radiogram showed a horizontal wisdom tooth, its cusps against the second molar, covered on the distal side by a bony spur. In this case also an unskilful attempt at extraction caused fracture of the tooth, but this was possibly partly due to caries.

On considering these cases the speaker had thought that it might be useful to draw attention to certain particularities in connection with the extraction of wisdom teeth, from the point of view of diagnosis, of radiographic examination, and of anæsthesia.

Last year, on saying that it was sometimes necessary to extract the second molar in order to reach the third, he had had some remonstrances from the back of the assembly. Nevertheless, this practice—which should only be resorted to on rare occasions—might be of the greatest value. Unfortunately there existed in the profession the evil practice of relying on empiricism for the extraction of wisdom teeth; he, therefore, insisted once more on the necessity of obtaining good and reliable radiograms before undertaking the operation. The phenomena produced by the eruption of a wisdom tooth were various. They might be in connection with the gum and produce trismus and swelling, they might be due to pus bound under a fold of the mucosa, the evacuation of which might relieve pain within twenty-four hours. In other cases the pain was due not to the wisdom tooth at all, but to some other cause; sometimes to caries of the inferior surface of the impacted wisdom tooth, or to a cusp of the lower wisdom tooth impinging on caries of the adjacent second molar. It was therefore absolutely necessary to form an accurate and complete diagnosis concerning the nature of the lesion and identity of the tooth. For this reason it became necessary that considerable changes should be made in our operative technique.

In most cases operators took first a pair of forceps, then a straight elevator, then a curved elevator, then Dr. Pont's elevator, etc. . . . and tried in this manner to get the tooth out . . . and it was in this way that so many teeth were broken. This procedure should no longer be adopted. The extraction of wisdom teeth if impacted, and especially if covered by bone, should be carried out as a proper surgical operation. The anæsthesia should not be by local infiltration, but by trunk or regional injection. The gum is then incised and reflected so that the field of operation may be clearly seen. Then the bone covering the tooth is attacked with scissors, mallet and chisel, and often a dental bur. For this latter one needs to work in a dental surgery, since a nursing home provides no facilities for the use of an electric engine. A clear view must be obtained above all things, without removing the second molar, if possible. If it has been necessary to remove the second molar the question arises as to whether it is best to replace it again. This rather depends on our individual methods, but there are some general considerations that should be observed: if there is no infection the attempt may be made if desired, but if infection is present it should not be made, for certain failure will be the result. Occasionally regional anæsthesia still leaves a certain amount of sensibility on the buccal aspect. A small local injection may be made here in these cases if no infection is present; this procedure gives the further advantage of a bloodless operative field. After operation the most usual unpleasant occurrence is dysphagia for some days. In conclusion, in order to avoid difficulties in the extraction of impacted wisdom teeth all the necessary precautions must be taken, a correct diagnosis must be made, good radiograms obtained, regional anæsthesia used, and operation as in surgery.

DISCUSSION.

A. Pont recalled his paper on the extraction of the second molar in order to facilitate that of the third. It was a method which should be used but rarely; but in certain cases one had to operate, not as one would, but as one could. For the rest he was in agreement with Mr. J. Tellier; the extraction of an impacted lower wisdom tooth was not a minor, but a major operation, which necessitated great precautions and constant personal supervision, owing to the risks involved.

A. Coste mentioned the utility of mouth washes on account

of the common occurrence of alveolitis. Carrel-Dakin's solution was used, and was prepared fresh by dissolving two tablets in a litre of water.

A. Remey, who had been called upon to extract a great number of impacted wisdom teeth, had remarked on the number of cases presenting post-operative pain; six cases out of ten had these pains, probably neuralgic in character and due to the proximity of the inferior dental nerve. In many cases a little injury to the nerve occurred which took eight or ten days to heal, and during which time pain was felt over all the distribution of the trigeminal nerve. The absence of any such pain after extraction of the first and second molars should be noted.

A. Coste thought that post-operative pain might be due to the presence of adrenalin in the anæsthetic solution. It had been advised that solutions without adrenalin should be used for regional injection.

A. Remey thought that concentrated solutions would cause more harmful results than dilute ones. In surgery the tendency was to use larger quantities of more dilute solutions.

L. Grenier asked whether in severe cases trauma of the soft parts was not considerable and sufficient to account for the post-operative pain.

J. Tellier, replying to the various speakers, said that he agreed with A. Coste on the utility of Dakin's solution. The deductions of A. Remey appeared to him quite correct inasmuch as one sometimes found parts of wisdom teeth grooved or pierced by the inferior dental nerve. For regional anæsthesia he used a solution containing no adrenalin. He thought that the more the question of the extraction of impacted wisdom teeth was considered the more it would appear in the light of a true surgical operation.—*Translation by Dental Record from Province Dentaire.*

The *Golden Prescription* is composed of just eight ingredients: good air, good water, good sunshine, good food, good exercise, good rest, good cheer, good thought. It doesn't make much difference how the ingredients are used—just so you get all of them. Take up the list each night, and see that every ingredient has been used, for the prescription is greatly weakened if any of the ingredients are left out.—*Personality.*

“ If ”

BY RUDYARD KIPLING.

If you can keep your head when all about you
Are losing theirs and blaming it on you;
If you can trust yourself when all men doubt you,
But make allowance for their doubting, too;
If you can wait and not be tired by waiting
Or being lied about, don't deal in lies;
Or being hated don't give away to hating,
And yet don't look too good nor talk too wise;

If you can dream—and not make dreams your master;
If you can think and not make thought your aim;
If you can meet with Triumph and Disaster
And treat those two impostors just the same;
If you can bear to hear the truth you've spoken
Twisted by knaves to make a trap for fools,
Or watch the things you gave your life to, broken,
And stoop and build 'em up with worn-out tools:

If you can make one heap of all your winnings
And risk it on one turn of pitch-and-toss,
And lose, and start again at your beginnings
And never breathe a word about your loss;
If you can force your heart and nerve and sinew
To serve your turn long after they are gone,
And so hold on when there is nothing in you
Except the Will which says to them: “Hold on!”

If you can talk with crowds and keep your virtue,
Or walk with kings—nor lose the common touch;
If neither foes nor loving friends can hurt you,
If all men count with you, but none too much:
If you can fill the unforgiving minute
With sixty seconds worth of distance run,
Yours is the earth and everything that's in it,
And—which is more—you'll be a Man, my son!



School Dentistry

This Department is Edited by
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Director of Dental Services—Department Public Health, City Hall, Toronto.

We are anxious to receive for publication in this Department reports of work carried on in School Dental Centres anywhere in Canada. Papers on any phase of Pedodontia would also be welcome.—E.A.G.



The Function of the Dentist in School Health Procedure*

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O understand a programme of procedure one needs to have an idea of the philosophy guiding the maker of the programme. Therefore, some of the dominant principles may well be presented as an introduction.

One function of a tax supported institution is to carry out the wish of the clientele paying the taxes. It often happens that such institutions must assume a certain amount of leadership, but great care needs be exercised lest we lead beyond the ability or willingness of the mass of taxpayers to follow.

There are two great tax supported or spending bodies in most cities—the board of education and the municipal government. The board of education has a clearly outlined task of study, i.e., to educate or train the youth for citizenship. The municipal government has many duties. It may and usually does have a health department which has to do with the broad preventive, sanitary and public health activities. The city government has also a welfare department which often must

*Read before the Child Hygiene Section of the American Public Health Association at Fifty-Fifth Annual Meeting at Buffalo, N.Y., October 13, 1926.

administer a "poor law" in accord with state laws. The administration of the "poor law" and the health activities often come under one division and so are linked as one in the public mind, however distant they are in actual administration.

FUNDS FOR RELIEF OR PREVENTION.

How far society should expend public funds for relief of the poor is not yet a settled question. Should society "go the limit" in such matters a state of socialism would exist that would minimize the results of personal effort to the extent of deadening all ambition and it seems would result in a decided retardation in our civilization; therefore we who have some part in the affairs of the day should be careful not to provide relief for the poor beyond the dictates of deliberate, conservative thought on the subject.

While it is the undoubted duty and function of society to care for the teeth of the poor to a certain extent, the subject requires most critical consideration and behooves us to proceed slowly.

The board of education's function is education. Education to prevent; not to cure, repair or restore.

The dental profession in earlier days held the philanthropic attitude of relief from pain (toothache) so common in school-rooms years ago. Repair was the next idea, but for the poor only. It is now generally conceded that it is not the function of a board of education to administer a "poor law."

Because of this viewpoint the Cleveland board of Education sometime ago discontinued dental clinics for the relief of toothache and the repair of diseased teeth for children of junior high school age. If one should grant that there is an element of educational value in reparative dentistry for junior high school pupils, the expense of such service would be too great for the public purse at present.

Two comparable groups of children have been observed: One group averaged 13 years (10 to 16), junior high school; the other 6½ years (first grade). It was found that the older group cost 5 times *per capita* the cost of the first graders.

Institutions that have attempted to provide dental care for children have year by year changed their policy, always taking younger and younger children. The routine procedure in Cleveland schools is to examine all children from kindergarten

to the sixth grade, inclusive, and to send notices to the parents after these notices have been used as a basis for a mouth hygiene lesson by the teacher.

Thus we obtain the interest of the child, the teacher and the parent. It is necessary to have all three interested to achieve results. One more person is needed in the picture—the dentist.

It is most difficult to educate the dentist to any great enthusiasm for the care of young children. Such service is rarely lucrative and frequently is attended with much exasperation and loss of time and patience.

DENTAL PROGRAMME IN CLEVELAND SCHOOLS.

In Cleveland it has been found desirable for the Board of Education and the City Health Department to undertake the limited dental care of school children. This requires first that a policy be adopted, otherwise nothing constructive will be accomplished and much money will be wasted. The policy in force in Cleveland is to give all service needed from a health standpoint to children in the first grade, about 6 years old. This service is given on the same theory that an arithmetic lesson is taught. It is a demonstration lesson in the hygiene of the mouth. We try to teach the child how it appears and feels to have his mouth normal; then how he can maintain that condition. Necessary extractions are made by private dentists or in a hospital and are paid for according to the patient's ability to pay. It is not the function of a board of education to give anæsthetics and perform surgical operations; but it seems to be imposed upon us to find the faults in the physical bodies of our children and bring the same to the notice of parents, even with insistence upon attention and correction, and it also seems to be necessary that we see that services are developed and maintained.

The initial service of filling, if need be, in the sixth year of life is followed by a prophylactic treatment—cleaning—by a hygienist once a year for 6 or 7 years. Thus we try to form the habit of mouth care. We do some considerable work for children of 5 years of age, our aim being to see the child just as the first permanent molar erupts and give him a careful examination to determine the quality of tooth structure in these first permanent molars. If found faulty we remove the faulty area and restore with metal before caries or decay has occurred.

This is preventive, whereas if we wait until a year later all we can do is to restore lost tissue and oftentimes we are too late to restore and so must advise surgery.

Some one asks, "Do you give this service free?" Certainly, just as free as a lesson in arithmetic. You would not ask the financial status of the home before teaching a child the multiplication tables.

It should, however, be understood that a very careful study has been made of all the 114 elementary school districts in Cleveland to determine the mouth conditions of all children and the social and financial conditions of each district. It should be kept in mind that Cleveland is a city of 79 or 80 per cent. foreign population. Some 35 schools have been excluded from our problem, hoping that the parents and private dental profession will handle the situation. I am fearful they never will, but will eventually insist upon the Board of Education rendering this type of service to all children, even the well-to-do.

Granted, there are some advantages in rendering mouth hygiene service in school, to all children under an organization, but such is not our policy at present. Cleveland is not equipped to do all that we believe we should be doing. We are doing about one-half or a little better of that which our policy dictates.

CLEVELAND'S MOUTH HYGIENE STAFF.

A few facts may serve to tell Cleveland's story more graphically. Sixty-nine persons are devoting their entire time to the mouth hygiene movement in Cleveland; 22 dentists spend their time with 6-year-old children; 17 dental hygienists teach the children from kindergarten to the sixth grade to use a tooth brush and how to use it, and also encourage the use of milk, green leafy vegetables, fresh fruits, and other vegetables as a proper diet; 22 mouth hygiene assistants act as clerks and helpers for the dentists and hygienists; 2 dentists and 3 assistants annually examine 85,000 to 90,000 children; 2 secretaries care for the office routine of records, etc., and the remaining one person tries to keep the staff working happily and efficiently.

EXAMINATIONS BY CLASS ROOM TEACHERS UNSATISFACTORY.

We have not felt that satisfactory results could be obtained by class room teachers making the examinations, for we observe that when teachers make the examination of the mouth the percentage of defects found is much lower than that found by dentists. The negative assurance given to parents by a teacher's examination is really dangerous, for if told that the child has good teeth nothing further will be done and the minor defects will shortly become grave defects and the child suffers permanently. For this reason we insist upon a dentist with trained eyes as our examiner. Our two examining dentists can well handle 100,000 children a year. Of course, some cities have a better record than this if numbers are the criterion. Our slogan is "quality first."

School health procedure from the dentist's viewpoint does not mean that the dentist in school service is of first importance. I have frequently told persons interested in developing health work in schools to get a nurse first, then a physician, then a dentist, then a dental hygienist. While it is true that decayed teeth are the most abundant defect and next to universal and all important, the dentist should not be the first, but should be third on the health staff.

PREVENTION, NOT REPAIR—THE POLICY.

The time has come when definite policies should be developed and followed in all health work in schools. We must learn to think in terms of the role or function of tax supported institutions and to realize what is essential for the health of our community. Let us not spend our time giving relief, but so teach and train the children as to prevent the need of relief and reparative service. The periodical examination is a wise public function for school children. The education of the child relative to the care and maintenance of his physical body is a wise public activity, but repair and restoration belong to another institution—the hospital or clinic.

It has taken time to realize these things; but once appreciated we should cease to operate dental repair clinics in public schools. Complaints will come whenever we make changes, but a short talk will convince any group of teachers that this is fundamentally sound even though inconvenient at the moment.

Poster making has become very popular of late as a method of teaching mouth hygiene. Posters made by the teachers have limited value, but posters designed and executed by the children themselves teach the lesson well and are of real value.

After all has been said we must add that the school procedure of to-day, the best we know, is working entirely on the surface so far as tooth conditions are concerned.

Why are 90 per cent. of the children suffering from defective teeth? The condition is simply due to faulty nutrition and assimilation when the teeth are forming. All the temporary teeth are forming before birth and faulty metabolism at this time means defective enamel and as a sequel decayed teeth. The first permanent molar, a very high percentage of which are faulty, is developing during the last month before birth, and during the nursing period. Any interference in assimilation of the mineral elements at this time leaves a permanent defect in the enamel forming.

It seems to make little if any difference what causes the interference in assimilation the tooth suffers. The essentials are that mineral salts be present in the diet in assimilable form and that the normal metabolism be not interrupted in the least, not even for a day. The period of nursing and the pre-school age must be passed without the common disturbances of childhood if we are to grow good teeth; and this applies as well to good tissue of every kind.

I shall not offer cod liver oil as a panacea, while I believe it of value, for the intake of food is only one factor in normal metabolism. Sunlight and fresh air, rest and exercise, water and light—all play important roles. It is not for me to prescribe the remedy, but I do appeal to you all to give more thought to the normal development of children from the day of birth to the day they enter school and at the same time we must not neglect the prenatal period.

When we grow good teeth we will change our school health procedure from the dentist's viewpoint, but until that day we must take the child as we find him at 5 or 6 years of age and make the best of a bad situation.

DISCUSSION.

William De Kleine, M.D., Fargo, N.D.—

Before discussing the paper of Dr. Wilson, I wish to outline briefly the objectives of the school health supervision programme.

First—Supervision of the environment as it relates to the health of children in the schools and on the playgrounds. Heating, ventilation, lighting, cleanliness, toilet, lavatory and drinking facilities as they pertain to both the school building and play grounds should be well regulated.

Second—Control of the communicable diseases. We should attempt to immunize all children, if possible, against those communicable diseases for which we have definite methods of immunization. Diphtheria and smallpox are two of these and perhaps very soon we can add scarlet fever. Typhoid should be included in certain sections of the United States.

Third—The detection and correction of physical defects. Regular health examinations and the correction of injurious defects should be encouraged. This should include dental examinations and corrections.

Fourth—Teaching health. In this symposium on school health the teacher has been inadvertently omitted from the programme. She should have been included for a discussion of this very important topic. The teaching both of dental and physical health in the elementary grades can be done best by the teacher if she is prepared for it.

I do not mean to make an arbitrary division of these four objectives. All are more or less correlated. The physician, the dentist, the nurse and the teacher all play a very important part in the entire programme and each one must correlate his work to that of the others.

A MODEL PREVENTIVE DENTAL PROGRAMME.

In the discussion of Dr. Wilson's paper it should be emphasized that a model preventive dental programme must include proper corrective as well as educational measures. The corrective work as outlined in his paper is a model of its kind, and worthy of the most careful study. The corrective phase of this problem is far more important than is generally believed. Nutrition alone cannot solve all of the dental needs of children even from a purely preventive viewpoint.

Frequently children are born with certain developmental (congenital) defects. They may be defects of the soft tissues, of bones or even of the teeth. The latter are by far the most common. As a matter of fact, they are so common that they are found in the teeth of the majority of children and they are

frequently, if not most commonly, the starting point of dental caries.

The defects referred to are the pits and fissures found in the enamel of both temporary and permanent teeth. What influence nutrition has on the development of these pits and fissures is not known. For some reason nature frequently fails to close in the enamel in the embryonic grooves of the teeth and, therefore, leaves a small fissure, pit or pocket in which debris accumulates. These defects are therefore present before the teeth erupt. Careful observation has shown that these pockets are frequently the starting point of dental decay. Nutrition, after the teeth are formed, can never correct these deformities. That can only be done by proper corrective measures.

A prominent dentist recently stated, "If enamel fissures in molars and bicuspid are treated at a sufficiently early stage, many teeth and still more pulps can be retained in a healthy condition. As experience forces this conviction upon an increasing number of dentists, the subject is bound to come more and more into the foreground of professional thought until it becomes routine practice."

MUST CREATE INTEREST AMONG DENTISTS.

The dental profession is generally not interested or concerned with early filling of these pits and fissures for children. They are more interested in corrective work for adults. It is therefore part of the public health programme to help create and develop this interest in the same manner that we are trying to develop an interest among physicians in the problem of preventive medicine.

This leadership must of necessity be given by dentists trained and experienced in this phase of dental practice. The dental hygienist, with her present training, is not prepared for this task. Under her leadership, the school dental work will likely develop into a programme of prophylactic treatments and education. The cleaning of teeth is constantly kept in the foreground and the corrective phase of the problem is overlooked. That in my opinion is fatal to a sound programme of preventive dentistry. The modern practice of cleaning teeth for school children is more or less wasted effort. The same effort expended on early filling of pits and fissures will produce

far better results. Experience has demonstrated this beyond any doubt.

The question is frequently asked, How shall we start a preventive dental programme for children? For the reasons stated, the answer should be: if possible employ a dentist who understands the problem of children's dentistry and who recognizes the importance of the corrective as well as educational measures in the preservation of sound and healthy teeth.

A. A. Crooks, M.D., Peoria, Ill.—

As Director of Health and Hygiene of the Peoria Public Schools, Dr. Wilson's paper interests me personally because his dental service lies in the city of Cleveland, the cradle of pioneer school dental hygiene activity.

School dentistry, while not originating in Peoria, the metropolis of down-state Illinois, has certainly added to its laurels by being one of the first cities to incorporate a dental hygiene programme in the public schools, constructively boosting and carrying on until it is the peer of any such programme anywhere. It is a great pleasure that I have associated with me Dr. C. Carroll Smith, who has instituted many preventive and dental hygiene measures that have been accepted as a part of the dental hygiene programme adopted in our most progressive centres.

Dr. Wilson touched upon a point that I want to criticize. He has stated with emphasis the number of reparative corrections that have been made in Cleveland by the dental force of the Educational Board, irrespective of the financial status of the children served. In Peoria we are attempting first, the reduction of reparative work by frequent dental examinations and intensive educational efforts; secondly, we are using every means of determining the financial status of the child's parents and their ability to pay for dental service. Children whose parents are financially able to employ private services, are referred to their dentist. We are overlooking no bets on that score if we can help it. Only indigent children are served in our dental dispensaries, and because of this attitude, we have the whole-hearted support of the local dental profession. Their motive is not altogether a monetary one, I am sure.

I believe the solution of our dental hygiene problem lies in working more closely with the local dental society—the society

of your county—and doing less and less indiscriminate corrective work in our school dental dispensaries.

Merrill E. Champion, M.D., Boston, Mass.—

I think it is absolutely a misnomer to talk about the desirability of “dentistry” in the schools. You might as well talk about gastroenterology in school, or surgery of the lower extremities, or something else. We should remember that what is ordinarily called dentistry in the school is really highly specialized surgery under the auspices of the school committee. If we could have dentists—and I say the same thing about the doctors—if we could have doctors and dentists who could be teachers first and doctors and dentists afterwards, I think much that has been said would be all right. But being a physician myself, I know how few physicians are teachers; dentists are in the same position exactly. I feel strongly that if we are going to have dental hygiene in the schools the safe course is to have dental hygienists and nobody else. I quite disagree with Dr. De Kleine on that point. As a matter of fact, when you put a dentist in a school, he feels he must operate.

Now, so far as giving this service to certain groups is concerned, it seems to me we are overlooking entirely the fundamental principle on which our public schools are founded, and that it is to give service to every citizen regardless of financial status. We ought not to have any distinction between rich and poor, if we are going to have service in the schools. My own feeling is, that we cannot give alike to rich and poor. That, at once, I think, cuts out the actual practice of dentistry there. I may say that in my state, Massachusetts, it is not legal for a school committee to carry on clinics of any kind. If they are to be carried on under municipal funds, they must be under direction of the board of health. That condition is bad enough, but it is better for the board of health to do it than for the school committee.

There was one point Dr. Wilson brought out, which, I believe, is worthy of mention, in addition to what has already been said. That is the idea of dental hygienists going into homes. It seems to me this practice would involve a duplication of service which can be given by the public health nurse.

William J. Bell, M.B., Toronto, Ontario, Canada—

There was one point brought out in the paper, not particularly stressed, but which I think is of sufficient importance to

reiterate, and that is that the man giving dental information should be thoroughly aware of the information he is giving; that is, he should give *correct* information because incorrect information may create a false sense of security that it will be a great hardship and handicap to the child for years afterwards in the losses that will ensue.

Harold H. Mitchell, M.D., New York City—

I should like to raise the question of the function of the dental hygienist, particularly in relation to the educational activities for promoting dental hygiene. Are we still to accept as a fact "a clean tooth never decays"? Are we all convinced that the work of the dental hygienist should be merely the cleaning of teeth? We learned from Dr. Cross at the luncheon meeting the other day to question the cleaning of the teeth as a method of preventing dental caries. We are faced with important questions: Should the dental hygienist teach dental hygiene to the children or suggest to the teacher how she may correlate dental hygiene with the other aspects of the curriculum to develop the necessary habits, attitudes and knowledge? What should be the functions of the dental hygienist in reference to mouth examinations? The question of giving up the dentist and using only dental hygienists is one that should be considered very carefully, as we must also consider the question of giving up the cleaning of the teeth by the dental hygienist except as a demonstration or as an educational measure.

Dr. Wilson—

I made the statement that we are not operating in 25 schools which we felt were patronized by rather well-to-do people. We feel that we will not have the antagonism of the dental profession if we stay out of this particular group of schools. It is totally impossible for us, at present, to go into all the schools, so why not leave out this group where the children, or rather part of them, go to the dentist, in the hope that we can encourage the others to go to the dentist, and have that work done by the dental profession, where the people are forced to pay for it?

Somebody implied that dentists are not teachers. My entire staff meets every Saturday morning, throughout the year, at 9 o'clock, for the entire morning. They are given a lecture on some subject related to our work, we discuss our problems,

and I believe it is the best group of teaching dentists I know, because they are taught what to present and how to present it.

A hygienist simply cannot do the work that a dentist can do. Our hygienists to-day—with I believe one exception—have one year of training after completing the high school course. You cannot expect that amount of training to prepare people to do a very great piece of work. But they can augment the work of the dentist and really do a valuable piece of work. When it comes to cleaning the teeth of the child and saying nothing to the child but letting him go on without keeping his teeth cleaned, it is absolutely a waste of time. Remember this—there is a big advertising company that says, “A clean tooth never decays,” but that is not true. Clean teeth will decay and some teeth that have no attention whatever and are frightfully dirty do not decay. Cleanliness is not the total factor. Probably cleanliness is a small factor in decay, but it is not the big factor. Now a dental hygienist can stand at the chair for 30 minutes and clean a child’s teeth, and during that time so encourage the child to keep his mouth clean, and thereafter to eat the proper foods, to go to bed at night and get the proper rest, and to drink a reasonable amount of water—that I believe she will really have done a good piece of work. A dentist must do the same thing when he is with a child—talk to the child. It is an educational proposition. The dental hygienist has no right, according to the laws of any state, to make a diagnosis. We cannot send a patient to the hospital with a diagnosis made by a dental hygienist. That must be made by a person licensed by the state to do that thing. The dental hygienists cannot be expected to do that, and if they undertake it they will get into trouble, because somebody may find out what the law is and make it very unpleasant. The giving of false information by saying that teeth are in good condition, is pernicious, because the parent takes that as final.—*American Journal of Public Health*, June, 1927.

Get knowledge all you can, and the more you get, the more you breathe upon its nearer heights their invigorating air and enjoy the widening prospect, the more you will know and feel how small is the elevation you have reached in comparison with the immeasurable altitudes that yet remain unscaled.—*Gladstone*.

PUBLIC EDUCATION

DENTAL HEALTH

"The public has decided it wants health talk and means to get it! The lay press is the most powerful medium of instruction for the public in health matters. We must do our best to secure its co-operation!"—Sir Thomas Horder.

IN this department each month will be published short articles suitable for use in the public press. The material has been authorized by the Oral Hygiene Committee of the Ontario Dental Association, and members of the profession may feel free to arrange for its publication in the local papers or magazines.

TARTAR.



YOU are faithful in your mouth toilet, brushing your teeth at least daily, but you still find deposits forming back of your lower front teeth, to which the tongue continually goes, because of their roughness, and which you cannot remove by brushing, try as you will.

Now, what is this?

"Tartar," so called, is salivary calculus, and as its name implies, it enters the mouth through the saliva.

The fresh deposit is soft and can be washed or brushed away when first it settles. This brushing must be done, however, within from five to twelve hours of its appearance, since remaining longer it begins to "set."

The calculus increases in bulk through more or less repeated accumulations, until often large and thick masses of it are formed; these, pressing upon the soft gum tissues, cause them to become inflamed, which inflammation progressing, may lead to the ultimate loss of the teeth.

Now, three "words" more:—

These deposits do not appear in every mouth, nor, where calculus does occur, is it found constantly.

"Tartar" is found generally on the "inside" of the lower incisors and cuspids and on the "outside" of the upper first and second molar teeth, the reason for this being that these localities are opposite the mouths of the salivary ducts.

Lastly—once calculus has formed its removal can be accomplished only through the medium of special instruments in the hands of the dentist.

But if you are subject to tartar, a faithful brushing following each meal, especially of these areas, will do much towards keeping the deposits down to a minimum.

THERMAL CHANGES.



YOU are fond of ice cream during the hot weather and of iced drinks. But you noticed that upon your last visit to the soda fountain, a certain tooth pained momentarily as you were enjoying your favourite dish.

Or, some toothsome sweet made it "sting"; and also, you found it more comfortable to take your tea not quite so hot. But, of course, it isn't bad enough to make a fuss over; a little care exercised and it will be alright again.

So you think!

Now what is happening?

You have suspected, and rightly so, a small cavity.

While Nature saw fit to place nerve and blood tissues within the tooth, yet she protected them with the very hard outer covering, the enamel which was meant to remain intact throughout the life time.

But through no fault of Nature, disease has crept in and her plans have been thwarted. Yet she is not yet baffled, for she has placed just within the enamel covering, tiny tissue filaments which communicate with nerve endings in the pulp chamber. These respond to thermal changes, sweets and acids, and instantly there is telegraphed to headquarters in the brain, the warning that something is wrong—just as when you put your finger on a red hot stove.

So forewarned, there is yet ample time to prevent more serious trouble if you would but do your part and act promptly by having repairs made.

But do you?

TOOTH BUILDING FOODS.



YOU decide to build, so you approach an architect who draws up plans and specifications; then the contractor walks in and supplies the materials called for, and your house goes up according to plan and without a hitch.

Now your tooth! Here's a piece of masonry: Nature the architect, you the contractor.

The element of chief importance in the development of teeth and bones is the calcium content, such as is supplied in

the lime of milk, in eggs, in cereals, in fresh fruits, vegetables, such as carrots, asparagus, cabbage, brussels sprouts, and many others.

First, the foundation must be well and truly laid, so the diet of the expectant mother should contain liberal amounts of these foods.

Now, as perhaps you may be aware, the teeth have been forming since before birth and their development continues throughout the early periods of childhood, until they erupt fully formed. So the diet of the child up to the fifteenth and sixteenth years should receive special care.

Also (it is important to note) in the period from the third to the sixth year, there is present in the growing jaws the greatest number of teeth that they will ever contain. There are in eruption at this time twenty temporary teeth and, in addition, the developing germs of twenty-eight permanent teeth, making a total of forty-eight fully or partially formed.

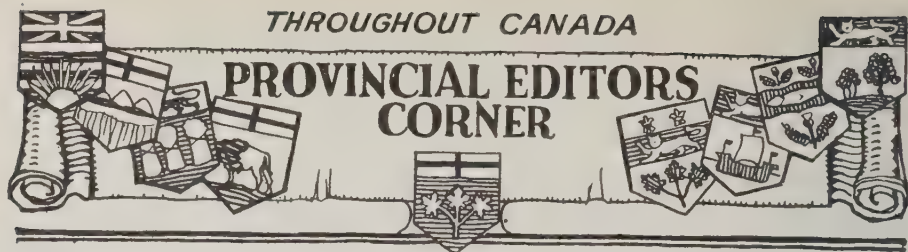
Hence, at this age and onward, the demand for lime phosphorus and other inorganic salts, apart from the needs for these materials for the developing bones, is unusually high.

Then this: Calcium is necessary in the clotting of blood and in the digestion of fats, so that if there is an inadequate supply of this element in the diet, the most available source to meet this starvation is in the lime of the teeth and bones, and in consequence, when called upon to meet these requirements for vital purposes, the teeth are structurally weakened and are left more prone to disease.

Then your structure fails—and whose fault?

Canadian Progress

“ANADA is first in the production of newsprint, asbestos, nickel and salmon; second in the use of the telephone and the production of motor cars; third in the production of gold and silver; seventh in the production of steel; tenth in the production of coal—all which indicates that Canada's prosperity is not based on any single line but is a universal prosperity, backed by agriculture.”—*W. C. Noxon.*



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Sherbrooke Street, Montreal.

*Provincial Editors will appreciate receiving from all local societies copies of
papers, society proceedings or personal notes, for publication.*



MARITIME PROVINCES.



THE following officers were elected at the 37th annual
meeting of the New Brunswick Dental Society, held
in Moncton:

Pres.—Dr. J. Kerr Higgins, St. John.

Vice-Pres.—Dr. Y. E. Gaudet, Moncton.

Sec.-Treas.—Dr. F. A. Godsoe, St. John.

At the annual meeting the Council of Dental Surgeons for
the Province of New Brunswick, held at the same time, the
following were elected:

Pres.—Dr. W. P. Broderick, St. John.

Registrar—Dr. F. A. Godsoe, St. John. —J. S. B.



QUEBEC.

MONTREAL DENTAL CLUB.



THE Montreal Fall Clinic will be held this year on
November 3rd, 4th and 5th, in the Mount Royal
Hotel.

The executive are pleased to announce that to
date the following clinicians have been secured: Dr. L. W.
Doxstater of New York (Crown and Bridge); Dr. Howard
Jackson of Detroit (X-ray Diagnosis); Dr. W. H. Wright
of Pittsburgh (Full Denture Construction); Dr. Alfred
Walker of New York (Root Canal Therapy).

The entire programme is being arranged with a view to the
practical application in daily practice of the problems arising
in these subjects.

The complete programme will be announced at a later date.

—M. L. D.

Oral Health

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EDITORIAL

Announcement of Appointments To Be Made of Hospital Interns and Research Assistants for Session 1927-28, University of Toronto, Faculty of Dentistry.



HERE are three types of annual appointments open to graduates in Dentistry, and which, by meeting certain requirements, may lead to the degree of Bachelor of Science in Dentistry—B.Sc. (Dent.):

- (1) Two interns in hospitals with Fellowships of the value of \$250 each, known as the Ontario Dental Fellowship, and the Ash-Temple Fellowship, and open only to graduates of this Faculty;
- (2) Three interns in government institutions with stipend of \$30 per month;
- (3) Five Research Assistants in the Faculty of Dentistry, each having a Fellowship of the value of \$1,000.

The interns will be appointed to hospitals and government institutions with properly organized dental services, and will spend not less than four hours each day in research work, under the direct control of the Faculty.

The five Research Assistants will spend their entire time in the Dental or other University building studying problems satisfactory to this Faculty and under its direct control.

In order to proceed to a degree of Bachelor of Science in Dentistry, all candidates are required to meet the regulations given in the Faculty Calendar. In brief, an acceptable graduate, in addition to giving one year of satisfactory service, including the study of one major and one minor subject, is required to submit a thesis embodying the results of his studies and to give evidence that he has a reading knowledge of either French or German. He is also required to pass examinations upon his thesis, and upon both his major and minor subjects.

The Dean will be glad to receive applications for any of these appointments or furnish further particulars if desired.

* * *

Regulations Governing New Degrees in Dentistry at University of Toronto

DEGREE OF BACHELOR OF SCIENCE IN DENTISTRY.

HE degree of Bachelor of Science in Dentistry has been added to the curriculum in Dentistry to encourage scholarship and research in the introductory dental and medical sciences, and in the sciences immediately accessory to dentistry.

The degree is available to two classes of candidates, namely: (a) *under-graduates* of the five-year course who have reached the end of the third or subsequent year, and who have completed an additional year's work outside the regular dental curriculum on the basis of an instructional schedule and research; and (b) *graduates* who have completed an additional year's work consisting chiefly of research in some one introductory or clinical department of the Faculty of Dentistry.

The regulations governing this degree are as follows:

1. That an undergraduate eligible for registration for the degree must have completed at least three years of the five-year course of the Faculty of Dentistry of the University or must possess equivalent qualifications;

2. That a graduate of the Faculty of Dentistry of this University who has completed the five-year course, or a graduate who possesses equivalent qualifications, may proceed to this degree. In appraising credentials of graduates of a dental course of less than five years, either taken in this University or elsewhere, time spent in the ethical practice of dentistry or its equivalent, may be considered in lieu of attendance at a recognized department of Dentistry;
3. That the course leading to the degree shall include one major and one minor subject, and shall require one year, in addition to the regular five-year dental course or its equivalent, in some primary or clinical laboratory of the University of Toronto. In addition, each candidate shall be required to submit a thesis embodying the results of his studies and to give evidence that he has a reading knowledge of either French or German.
4. That in each case the subjects selected for the thesis and for the major and minor studies must be approved by the Faculty of Dentistry, and each candidate, before being granted the degree, must pass examinations upon his thesis, and upon both his major and minor subjects, such examinations to be conducted by the Faculty of Dentistry or by a committee appointed for the purpose by this Faculty.

DEGREE OF MASTER OF SCIENCE IN DENTISTRY.

A candidate eligible for registration for this degree must be a graduate of the regular undergraduate course of the Faculty of Dentistry of the University of Toronto or must possess equivalent qualifications.

The regulations governing the degree are as follows:

1. That the course leading to the degree shall include one major and one minor subject, and shall require at least two years of post-graduate study in some primary or clinical laboratory of the University of Toronto. In addition, each candidate shall be required to submit a thesis embodying the results of his studies and to give evidence that he has a reading knowledge of either French or German;
2. That a graduate in Dentistry who has been granted the degree of Bachelor of Science in Dentistry, or its equivalent, may be granted credit of one year of post-graduate study toward the degree of Master of Science in Dentistry;
3. That in each case the subjects selected for the thesis and for

the major and minor studies must be approved by the sub-committee of the Graduate School which administers the regulations governing the degree, and each candidate, before being granted the degree, must pass examinations upon his thesis, and upon both his major and minor subjects, such examinations to be conducted by the staffs of the departments concerned.

* * *

Conference of Canadian Universities and Dental Standards



THE Conference of Canadian Universities, held in the City of London, Ontario, June 1st, 1927, the following resolution was unanimously adopted:

"That this Conference approves the principle of the course of study in Dentistry commonly described as the one-five or two-four course of study as the minimum of preparation for the practice of Dentistry."

Mind and Body



SO subtle and profound is the interweaving of mind and matter that every true advance in self-expression, in spiritual liberation and mental integrity, induces an enhanced tone in physical function and bodily appearance. But equally, every true advance in the cleansing of the bodily tissues and in their regeneration or remaking with pure blood, induces a cleaner mentality, a more serene and courageous outlook, a greater capacity for sensing the infinitely varied spiritual values involved in earth-experience, however difficult and even tragic that existence may be for any given individual."

"The idealism which inspires the true beauty culture—the beauty that is born of the fusing together of free expression and self-discipline in body, mind and spirit—is therefore of necessity two-fold: it is as much concerned to rid the physical organism of its accumulated defects and impurities as to release from sub-conscious depths the knots, tensions, morbidities which pervert the mind and stifle the soul; as eager to raise the tone, quality and vitality of all the functions and organs of the body as to quicken the mind to a sense of the beauty of holiness, or whole-ness."

The Best Things

THE best things are nearest—breath in your nostrils, light in your eyes, flowers at your feet, duties at your hand, the path of God just before you. Then do not grasp at the stars, but do life's plain, common work as it comes, certain that daily duties and daily bread are the sweetest things of life.

—Houghton.



DOCTOR GEORGE L. CAMERON,
SWIFT CURRENT, SASK.,
President, Dental Society of Western Canada, 1927.

ORAL HEALTH

*A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION AS WELL AS THE POUND OF CURE"*



Vol. 17 TORONTO, SEPTEMBER, 1927 No. 9

Proceedings of the Ontario Dental Association, 1927

PRESIDENT'S ADDRESS.

J. A. BOTHWELL, D.D.S., TORONTO.



ENTLEMEN of the Ontario Dental Association: Your Society, this year, has reached a time in its existence when it should look steadfastly into, and think seriously about, the future. This should be easy because we have as an inspiration, the success attained by our efforts in the past and the standing we now have in the present. A glance backward through the sixty years of our organized life will show us the strides we have made.

We were first organized away back in 1867—in a very humble way with many handicaps, only a few members, and a very weak financial backing. We have grown, especially in the last ten years, to our present enviable position—that of one of the strongest provincial dental organizations in Canada. The work our Association has accomplished in increasing its membership, in educating the public, and in placing itself in a sound financial position is most wonderful indeed. Its present status is sound beyond doubt. Our annual meetings are more than well attended; our programmes are the best available; our finances are such that we have some bonds, and a good cash surplus in the bank.

For our future we should be most concerned. But as I said before, inspired by the efforts and results of our predecessors, it is necessary only to put our shoulder to the wheel and push on for greater things. With this perseverance and the co-operation of the Government, we are bound to succeed. Recently

the Canadian Dental Hygiene Council had a contribution of \$5,000 from the Dominion Government and \$2,500 from the Red Cross Society, to be spent for the purpose of dental education. The Red Cross Society assisted us in making our Dental Health Day the success it proved to be. In the coming Red Cross campaign we should aim to be of valuable assistance to them, remembering the thought in the old but true motto, "He who seeks to serve another, best serves himself."

The report of the Oral Hygiene Committee will show that the Ontario Government is planning big things which will make for better Dentistry. In the Provincial Secretary's Department, under the leadership of our capable Dr. Conboy, efficient dental service will be established in Ontario hospitals and mental institutions. Where the Hospital authorities will meet the requirements of the Department, a Dental intern will be appointed. Each intern will remain one year. His work will consist chiefly of research and at its termination he shall be required to submit a thesis embodying the results of his studies. If this, together with one or two other requirements, be completed satisfactorily, the intern may receive the degree of Bachelor of Science in Dentistry. The degree of Master of Science in Dentistry is also available.

The Department of Health is taking the lead in the dental health education of the people, and all dentists should co-operate. The Government has sent a dentist to Northern Ontario to do free work for the people who cannot pay. This will not interfere with, but rather aid, the practice of the resident dentist.

One active step being taken by the Ontario Dental Association is the donation of a \$250.00 scholarship to any dentist who will take an internship in an Ontario hospital with a well organized Dental Department as a major service. Another is our assistance in the education of the adopted son of one of our own Ontario dentist missionaries. One of my confreres will tell you more about this.

Now that I have given you a word picture of our future possibilities, it behooves us, as dentists, to work and live for Dentistry; to do research and all kinds of educational work for the welfare of the public and our own. Our duties will not have ended until we have reached the pinnacle of perfection. Now let us realize our responsibilities and go forward to make Dentistry bigger and better than ever.

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MINUTES OF THE GENERAL SESSIONS.

MINUTES of meeting of the Ontario Dental Association, held at the King Edward Hotel, on Monday, May 16th, 1927, at 2 p.m., are as follows:

Dr. J. A. Bothwell, of Toronto, President of the Ontario Dental Association, acted as Chairman.

Dr. Bothwell, after the opening remarks of welcome of this year, the Diamond Jubilee, introduced Thomas Foster, Mayor of Toronto.

The Mayor then gave his address of welcome. He extended a warm greeting to all the members from all parts of Ontario and of the other Provinces, and remarked that the work they were undertaking was of very high-class quality; it was a work that had to do with every family and every person in the community and that it was impossible to get along without the dentists. He hoped they would take a special interest in Toronto at this particular time, this being the Diamond Jubilee year, and he hoped many would come back to join in the July 1st demonstrations. He further remarked that their being here was to exchange ideas and to develop improvements in connection with the profession. Some had been in practice for many years; that it must be very interesting to have the knowledge that has developed in the last two or three years, and after the Convention to return to their own communities, benefited by these improvements and better for their visit and trip to Toronto. In his closing remarks the Mayor expressed delight in welcoming the Association, and in extending the freedom of the City while they remained.

Dr. J. W. Clay, President of the Canadian Dental Association, was called upon to reply to the Mayor's address.

Dr. Clay in addressing the meeting remarked: "It is not always that pleasure and duty go hand in hand." He considered the present such an occasion, when the opportunity was afforded him to reply to the welcome expressed by His Worship, the Mayor. His kindly words of welcome were appreciated by all the visitors to the City of Toronto, from the various provinces.

He further remarked that it was well that the dentists of Canada should hold their principal meetings either in Toronto or Montreal, as these cities had been the chief centres in the history of dental advancement in the Dominion of Canada.

He further expressed appreciation for the provision of suitable quarters and the opportunity afforded for meeting friends and obtaining professional information. He also thanked the Mayor for his cordial invitation to accept the hospitality of the City, and speaking on behalf of the visitors he could safely say that they would enjoy themselves to the fullest extent.

It was moved by Dr. F. J. Conboy, and seconded by Dr. Wallace Seccombe, that the programme submitted be the official order of business for this Convention.—Carried.

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The Chairman then called on Dr. A. W. Winnett of Kingston, Vice-President of the Ontario Dental Association, to take the chair.

Dr. J. A. Bothwell, President of the Ontario Association, was then called upon, and he gave his address for 1927.

It was moved by Dr. J. C. Devitt, seconded by Dr. Clarke, that the address of the President receive a place in the minutes of the Ontario Dental Association.—Carried.

Dr. Bothwell at this juncture presented the Association with a handsome gavel and said in part:

"For ten years I have had much joy in serving this Association. I have seen it through a decade of wonderful progress. I have been its President through this, its Diamond Jubilee year. To commemorate this milestone in the history of the Association and to materially express my appreciation of the honour paid me in giving me the presidency, I ask you to accept this small gift, the donation of which affords me unlimited pleasure."

Dr. Winnett, Vice-President, accepted the gavel on behalf of the Association and he expressed their appreciation for this beautiful gift from the President. He felt certain that the gavel would be used for calling to order many such illustrious gatherings as were assembled to-day.

Addressing the members of the Ontario Dental Association and our American clinicians and essayists who so kindly had come to Toronto to assist in making this Convention a memorable one, he congratulated Dr. Bothwell on being President of the Ontario Dental Association through this our Diamond Jubilee year, also that they had associated with the Ontario Dental Association, the Canadian Dental Association, which was represented on the platform by Dr. Clay of Calgary. He expressed the hope that it would be a Diamond Jubilee, not only in members, but also in the good which may be derived by each and every member from this Convention, taking great benefit back to their homes from the Clinics and papers which they would receive.

He again expressed great pleasure in accepting the gift from Dr. J. A. Bothwell on behalf of the Ontario Dental Association.

At this point, the Nominating Committee was named as follows: Dr. Willard Armstrong, Richmond Hill; Dr. A. O. Marshall, Belleville; Dr. W. A. Armstrong, Ottawa; Dr. M. A. Ross Thomas, London; Dr. F. P. Moore, Hamilton.

Dr. Willmott reported that at the last meeting of the Canadian Dental Association he had been appointed a Committee of one, and as such had written the Secretaries of the different Provinces to ascertain the names of those practitioners who had died during the last year. The members stood in silence while the names were read and the Last Post was sounded.

Dr. C. N. Johnson, of Chicago, was then called on and gave his very interesting address on "What of the Future?"

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The President then asked if there were any discussions of Dr. Johnson's paper.

Dr. Gallie replied by saying: "What more could anyone say? After listening to the splendid address of Dr. Johnson, and realizing the hope and faith that he has in the future, we are convinced that not a word could be added to the address. It is a classic."

The President then, on behalf of the Association, thanked Dr. Johnson for the presentation of his wonderful paper.

Dr. Robt. Ivy, of Philadelphia, was then called upon and gave his address on "A Complete Mouth Examination for the removal of all Dental Infection," illustrated by lantern slides.

The President called upon Dr. Fulton Risdon to open the discussion on Dr. Ivy's paper. Dr. Risdon said:

"We are always glad to have our friends from across the border come to our meetings; but in Dr. Ivy's case there is more cause for rejoicing, as he is of British birth.

"Dr. Ivy always brings something of special interest, and because of his wide experience, and further because of his association with one of the fathers of oral surgery on this Continent—Dr. Cryer—he is especially fitted for the teaching of Oral Surgery. He is kind enough to come, not only with a paper, but he is giving clinics every morning of this week, and I am sure that we shall be well rewarded for attending them.

"There is not much room for a discussion, because Dr. Ivy has introduced little of a controversial nature, and in a sense his paper is rather text-book in type, covering a large amount of the surgery spoken of as Oral Surgery. I note an undertone throughout the paper urging that men doing oral surgery should be well trained, and that in his country they are being born over night, with a minimum amount of training. He emphasized the necessity of rigid sterilization, and that the boiling of the instruments is the method of choice for office use to prevent mixed infection.

"I hoped to hear Dr. Ivy describe more fully the dental cyst, as we feel there are two types, one which is lined by squamous epithelium, likely due to residual squamous cells being stimulated by periapical infection, and the other lined by columnar epithelium, which is of the cell-rest type. This problem has interested me for years, and is only of importance from a scientific standpoint.

"As to his outline of the treatment for other conditions, I am in accord with him, and can only say that we welcome him as an old friend; and to those who do not know him, I would suggest that they become acquainted with him at the earliest opportunity.

"Mr. President, I thank you for this opportunity afforded me of opening the discussion of Dr. Ivy's paper."

The President then asked if there were any further discussions—and thanked Dr. Ivy on behalf of the Association

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for the presentation of his paper which had, he remarked, covered the ground thoroughly.

There being no further discussions, the meeting then adjourned.

The minutes of the meeting of the Association held at the King Edward Hotel on Wednesday, May 18th, at 2.30 p.m., follow:

The President, Dr. J. A. Bothwell, acted as Chairman.

Dr. Conboy spoke on the Constitution and By-laws adopted by the Canadian Dental Association; membership, membership fees, etc., and stated that by joining the Ontario Dental Association, one became a member of his own Provincial Association, and a member of the Canadian Dental Association.

Dr. Conboy further presented the Constitution and By-laws of the Canadian Dental Association and suggested that it might be referred to the Board of Governors, to be gone over carefully.

Moved by Dr. Conboy and seconded by Dr. Willmott that the Constitution and By-laws of the Canadian Dental Association as submitted by your delegates be approved in the main and referred to the Board of Governors that they may go into the matter in detail and see that it is satisfactory to the Ontario Dental Association and if so, the whole scheme to be accepted.—Carried.

Dentists' Legal Protective Association.

Dr. Harold Clark, President of the Dentists' Legal Protective Association, was then called on for a report. In the absence of Dr. Clark, Dr. Willmott, Secretary of the Protective Association, spoke. He stated that in the first place, their annual fee entitled members to all the privileges of the Protective Association. That while the Association would not take any part as between the dentist and his patient regarding fees, misfitting dentures, or fillings that have come out or bridges that were no good, if a dentist got in trouble with his patient, he should write the Association, who would advise him as to what they considered his right. That they had had a number of instances where there was some misunderstanding between the dentist and his patient regarding work not satisfactory, and the Solicitor of the Association had advised whether to return part or all of the fee paid, for his own good in the community, etc. That if a case of suit for mal-practice is brought against any dentist, the Dental Protective Association would assume responsibility, provided it had the handling of same from the inception. If the matter had been referred to someone else they would refuse to touch it. Mr. Hellmuth was the Solicitor of the Dentists' Protective Association.

At this point the question was asked: "I have an Insurance Policy. What is the use of having insurance and belonging to the Association as well?"

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Dr. Willmott replied: "Just this—if you have a suit for mal-practice and you lose the suit, the Insurance Company pay the damages. If we conduct the suit and lose,—you pay the damages."

Dr. Willmott then read the Treasurer's Report of the Dentists' Legal Protective Association as follows:

Financial Statement. Year ending April 30th, 1927.

Cash from last year	\$4,484.39	
Fees, 1925-26	18.00	
Bank interest	130.85	
		\$4,633.24
Bank Exchange	.40	
Expenses, Executive Committee	5.70	
Printing and Folding Two Notices to Profession and 3,600 Envelopes	51.88	
Addressing, Mailing and Postage	46.50	
Honorarium to Secretary-Treasurer	100.00	
		204.48
On Hand		\$4,428.76

Moved by Dr. Willmott, seconded by Dr. Walker, that the Treasurer's Report be adopted.—Carried.

Moved by Dr. Bothwell, Stratford, seconded by Dr. Davidson, that the Executive of the Dentists' Legal Protective Association be the same as last year.—Carried.

Harold Clark, President.
W. E. Willmott, Secretary.
Wallace Seccombe.
R. G. McLean.
W. G. Thompson.
F. J. Conboy.

Dr. A. E. Webster was called on by the President to tell the Society of the development of Canadian Dentistry in far off and much disturbed China. Almost twenty years ago Dr. Lindsay was sent out to China by the Canadian Mission Board to care for the teeth of missionaries and to later establish dental education in China. The work prospered and others were sent out, until at the present time there is a Faculty of Dentistry established in China in the Union University. Chinese are now being graduated and a Dr. Whang has been sent to Canada to complete his training, so that when the present disturbance subsides he may be in a position to carry on the work. It would appear that Chinese in the future will be at the head of all educational institutions in the land. A couple of years ago a group of Canadian dentists agreed to finance a Chinese graduate for two years in Canada if the Mission Board would pay the travelling expenses. The Royal College of Dental Surgeons and the University have assisted. Dr. Whang is a good student and has done well this year. We explain all this to you so that if at some time you are

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given an opportunity to assist in setting up a Canadian Dental Outpost in China you will understand what it is all about.

Report of Nominating Committee.

Dr. Willard Armstrong presented the Report of the Nominating Committee, as follows:

Hon. President: J. A. Bothwell, Toronto.

President: A. E. Webster, Toronto.

Vice-President: T. F. Campbell, Galt.

Archivist: C. A. Kennedy, Toronto.

Secretary-Treasurer, F. J. Conboy, Toronto.

Board of Governors: S. A. Moore, London; W. H. Woodrow, Brockville.

Oral Hygiene Committee: A. W. Ellis, J. C. Livett, F. C. Husband, R. J. Reade, W. R. Armstrong.

Moved by Dr. Armstrong, seconded by Dr. Marshall, that the above Report of the Nominating Committee be adopted.

Dr. Husband moved an amendment to the motion, seconded by Dr. Murphy, that these names be received in nomination only.

The Chair was requested to explain the motion and the amendment. The Chairman called on the Secretary to read the motion and amendment and he explained that if the motion was carried, those named by the Nominating Committee would be the officers for next year. The Amendment was that these names be accepted in nomination for the various offices. If the amendment carries, these will not necessarily be your officers for next year, but you will have the opportunity of nominating others and there will be an election by ballot. If it was the wish that the names read be the officers for the ensuing year, they were to vote for the motion; if otherwise to vote for the amendment. The President then put the amendment, which was lost.

An amendment to the amendment was then made that they take the names presented as nominated for the different offices, and that the names submitted for President and Vice-President be closed, and that they vote on the other officers. As this was in reality the same as the amendment just voted upon, it was not pressed.

At this point Dr. Fleming, of Preston, asked for more information. He remarked—"the names that have been nominated by the Chairman of the Nominating Committee—some of them are familiar to us—some are not. I have no objection to any man that has been nominated, but I could vote more intelligently if I knew where these men came from. As a member of the Ontario Dental Association, I feel that the members of the Board of Governors should be spread over the Province and I think it is in the best interest of the Society that the Officers of the Association should represent all parts of the Province. Therefore, I feel that I, and there are no doubt

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others just as helpless as me, could vote more intelligently if we knew where these officers resided.

The Chairman then stated that when the President appointed the Nominating Committee they were selected from ten names submitted by the Board of Governors. These men he felt sure were representative men in that they were outside of Toronto, one from Ottawa, Belleville, Richmond Hill, and one from London. He felt that the men nominated were from various sections of the Province and represented different bodies of dentists. He then called upon the Chairman of the Nominating Committee to read the names and resident places. This was done.

At this point it was voiced that it would be well to remind the gentlemen that there were some on the Board of Governors that were elected for a term of years.

The Chairman then stated that according to the Constitution they had six members of the Board of Governors that are selected—two were elected each year for a period of three years. The present nominees were Dr. Moore of London and Dr. Woodrow of Brockville.

Dr. Fleming then stated that they now had the information asked for. He thought it a very good list and that a lot of time could be saved by accepting the Report of the Nominating Committee.

The President then stated that the amendment was lost, and asked that the original motion with the names submitted by the Nominating Committee be accepted. And asked "What is your pleasure regarding the motion that these men in nomination be declared elected?"

The President put the motion and it was declared—Carried.

Dr. Russell W. Tench, of New York, was then called on, and gave his interesting paper on impressions for "Full Dentures," followed by explanatory remarks.

Dr. W. D. N. Moore, of Chicago, then gave his interesting paper on "A Broader Vision of Bridgework."

Dr. Roach was then called upon to discuss the two papers, by Dr. Tench and Dr. Moore. Dr. Roach remarked that neither of these two papers was he familiar with. He had not had an opportunity of knowing what Dr. Tench was going to say; only last night had he read Dr. Moore's paper. Dr. Roach then gave a short discussion of each paper.

The President stated that the next paper was by Dr. Andrew J. McDonagh, on "A Study of Bacteria in Living Pulp." Dr. McDonagh being ill and unable to come, his daughter, Dr. Aileen McDonagh, read her father's paper.

Dr. Bothwell was forced to leave before the close of the Session to attend the reception at the Granite Club. Dr. Fleming took the chair in his absence, and at the close of the meeting Dr. Conboy, on behalf of the Board of Directors, thanked the members for their co-operation in making the meeting a success.

Afterthoughts Concerning Impressions for Full Dentures*

RUSSELL WILFORD TENCH, D.D.S., NEW YORK, N.Y.



IN one sense an afterthought is a reflection concerning an act that occurs too late to affect that particular act. In another sense an afterthought concerning a procedure oft repeated, may be a forethought. The use of afterthought concerning past efforts in denture impression technique to favourably influence our attitude toward future efforts, is the object of this paper.

Afterthoughts in this field usually occur some time after the appliance, made from the impression, is inserted, and it is therefore rather difficult to limit the treatment to impressions alone. We are led to consider results that follow the insertion of dentures.

Whether one's afterthoughts, concerning the final outcome of impression technique, may be pleasant or tinged with disappointment depends, aside from manipulative skill, upon the angle from which he approaches the problem of impression technique and upon the ideals he has set up for himself as well as his conception of what constitutes the true use of an ideal.

If he approaches the subject as one of general physics and forgets the biologic or physiological biologic aspect of the subject, disappointment is more of a certainty than a chance.

If he approaches the subject as he should, he will take cognizance that he is preparing appliances that are to function on living tissue. He will know that nature never intended that foreign bodies should find lodgment continuously against the tissues of the oral cavity usually covered by dentures, and that she has neither shaped the physical form of the mouth for this purpose nor planned the structure of the delicate tissues to maintain their integrity against thoughtless abuse. He will understand that to get best results it may be necessary to alter the form of the ridges and always to proceed with thoughtfulness.

The first essential in any impression is that it should have

*Read before sixtieth anniversary meeting of the Ontario Dental Association, May, 1927.

stability when subjected to stress such as might be employed in mastication. After stability is obtained retention should be considered. The retention of a well designed set of dentures need only be strong enough to keep each denture in position during functional activities other than mastication. If more than this is attempted in the average difficult case the afterthoughts of the patient and dentist may not be so pleasant to contemplate.

The amount of retention that may be obtained for a full impression may vary from mere adhesion to a marked degree of atmospheric pressure retention that will require definite and forcible efforts to dislodge the finished denture from its seat in the mouth. Should extreme retention be necessary to the successful use of dentures by any patient, then 90% of the edentulous would be unable to wear artificial appliances at all.

The maximum retention possible for a very favourable case should not be the ideal for all cases. Each case is a law unto itself, and the less one is required to compress or displace tissue or extend the impression margins at rest so that functional activity of adjacent tissues is interfered with, the more satisfactory the final outcome will be.

Not the least objectionable feature encountered in promising or working for retention without considering muscle and nutritional functioning is the adverse effect produced on the attitude of the patient from loss of retention that occurs from traumatic pressure change or reduced retention when soreness is relieved.

Impression technique may be the cause of loss of retention. This is a certainty. However, all failures in retention of dentures are not due to faulty impression technique. The degree of accuracy necessary to make a very satisfactory full denture impression is more susceptible of variation without injurious results than is the degree of accuracy employed in registering central occlusion or in working out a balance in the contact of the opposing teeth in various lateral or protruded occlusions.

When either denture is well retained during speech and displays a fair degree of stability to digital examination when placed in the mouth singly, but is dislodged when used with the opposing denture, do not seek for the fault in impression technique until you have thoroughly checked the various functional relations of the dentures, starting with central occlusion.

The better one works out central occlusion and balance in the articulation of the teeth and perfects these things in the mouth, the less will be the necessity for resorting to technique that holds the denture in place against the tipping or dislodging stress of faulty occlusion. Faulty occlusions may on the other hand cause traumatic pressure on the lingual bicuspid region of the mandibular ridge or the palato-incisal region of the maxillary arch with subsequent loss of retention.

Afterthoughts point to the flat contradiction of a line of reasoning broadcast some years ago, and still prevalent in the mind of the profession to-day. This statement implied in substance that if one got the impression right, it did not matter how careless you were about articulation; the denture would work. This is not only erroneous, but it is positively dangerous to the patient, as technique necessary to get such a result, temporary as it usually is, may be a cause of marked resorption and sometimes almost complete destruction of the osseous alveolar ridge when it is employed several times in succession in an effort to maintain the "good" fit the patient has been misled to demand.

If you are not inclined to feel that our profession look to the impression as the best avenue to results, recall the crowds and interest displayed in an impression clinic and contrast this with the sparse attendance at clinics dealing with central occlusion or articulation occurring at the same time.

The permanence of retention of dentures during function and the comfort with which they may be worn if carefully made depends upon visible and invisible factors other than physical characteristics previously discussed.

The visible factors are those that may be found by a visual and digital examination of the mouth. The invisible factors are those within the patient's body or oral tissues, the possible effects of which are not distinguishable for some time after dentures are inserted.

The visible factors may influence one's choice of technique. They determine to a certain degree what a patient may expect of dentures insofar as they favour such mechanical advantage as may simplify the patient's problem of using dentures. The visible factors are, however, not an absolute guide nor a reliable index for prognosis, especially if the patient is being fitted with a first set of dentures. Promises made to an inexperienced denture patient based on visible factors are an indication of

the dentist's good intentions and also of inexperience. No operator should ever promise anything but an honest effort to employ his full skill and experience in treating his patient's case. If he does more than this he is laying himself open to the suspicion of incompetence and loss of valuable time in attempts to make good his promises when the unfavourable unknown factors get in their work, and he may arouse in the patient's mind expectations impossible of fulfilment.

To illustrate this let me cite three cases in which the visible factors were favourable. A woman, middle age, teeth lost as a result of pyorrhœa and focal infection. The dentures, when inserted, exhibited remarkable retention. The patient was able to bite pieces out of a hard apple and masticate successfully and comfortably from the moment dentures were fitted. Six weeks later neither denture exhibited a semblance of stability or retention. They were rebased. Eight months later, the same loss of stability and retention was observed. The dentures, rebased again, retained their stability and retention for almost two years when they again required rebasing. The patient has not since appeared for treatment and seems to be comfortable and satisfied.

Second case: a man, twenty-eight, tubercular. Due to extensive caries and some periodontal disease, hospital staff advised extraction of twenty-four teeth. Ten days later patient proceeded to a sanitarium wearing full dentures. The mouth, at time of departure of patient, was too sore to permit tests of retention, which seemed to be moderately good. Two years later patient returned, both dentures exhibited excellent retention and stability to all tests, but required some relieving of flanges where they were impinging on border tissues. About eighteen months later retention of both dentures still excellent and no soreness was apparent. The facial expression indicated that there had been an extensive loss of alveolar tissue with closing of the bite, in the four years the dentures had been worn.

Case number three: a woman, thirty-eight, full upper denture and bilateral partial lower, supplying four molars. Upper denture is retained to all tests in a most satisfactory and extreme way. Patient complains that the denture constantly dislodges while eating. A test lunch discloses the fact that in mastication this patient crushes food particles by closing in central occlusion and grinds by thrusting the mandible laterally;

just the reverse of the usual procedure. No amount of effort or persuasion can induce this patient to try to help herself.

The self critical dentist might blame his impression technique for the good or bad results in these cases, when, in the speaker's opinion, the unknown factors presented by the patient in each case are the cause of the abnormal results obtained.

The visible known factors are:

1. The visible condition of the tissues that will be used in supporting dentures. (a) State of health, such as presence of inflammation or surface irritation of mucosa, or trauma from extraction. (b) Thickness of mucosa.

2. Oral secretions.

3. Form and size of denture base area.

The health of the mucosa at the time of impression making is important. Any irritation in the form of swelling or hypertrophy present in the mouth should be reduced by the use of mild antiseptic washes and rest from an offending denture. A most valuable aid in such procedure is found in the form of Caryl Dakin Solution known as Tri-Chlor when used as a mouth wash every three hours in a solution of 15 drops to a glass of water. When irritation is caused by the dentures being worn, they should be relieved to avoid further irritation from them and they should be worn only at meals for a period of not less than forty-eight hours before impressions are taken. When this is not possible, due to the nature of the activities of an individual, the offending denture or dentures should be temporarily rebased with compound and kept removed from the mouth during periods when their use is not a necessity, until the inflammation is reduced. Failure to observe these precautions has resulted in a loss of retention due to a leak caused by the resolution of the irritated tissue with consequent reduction in thickness.

Irritation due to extraction should be permitted to subside for ten days, at least, before dentures are constructed. The writer is not one of those who favours the insertion of dentures immediately after extraction, as in some instances this being done where infection was deep seated produced irritation that might have ended disastrously. The only excuse for such a practice is a desire to cater to the wishes of a patient, as against the logic of good surgical procedure of allowing full drainage. Were the mouth not the habitat of many varieties

of bacteria, or if denture patients could be relied on to follow instructions, immediate denture insertion might be accomplished without added chance of infecting the osseous ridge tissues and causing subsequent irritation and discomfort.

The most difficult cases the careful technician has to handle are those for which impressions have to be made following extraction. While such conditions do not greatly impede normal procedure, the after effects that come from normal reduction of size of the ridges due to healing and regeneration of the traumatized areas produce a reaction on the mental attitude of the patient that will require years of concerted effort to educate the public before it is eradicated. It is an open question in the writer's mind as to what procedure should be followed to give the recent extraction patient the best results, and cause the operator the least loss of income through expenditure of time that custom makes it difficult to collect a fee for. While it is not rightly within the scope of the subject of this paper, it is a fact that from the standpoint of difficulty and after treatment required, the fees for constructing good dentures shortly after extraction should be larger than for constructing dentures for patients who have previously worn them. The trouble that a patient, already run down before teeth are removed, may cause a dentist and blame him for, would fill volumes.

It requires about a year and a half for tissues from which teeth have been extracted to assume a normal edentulous ridge state and while reaching this condition much trouble attributed to faulty impressions may occur. Many a conscientious, careful operator has suffered loss of reputation and patronage by failing to recognize this fact and impress it upon his patients, or due to failure to get them to believe it, if he did speak of it. The general practitioner should take cognizance of this fact and preach it or do as the practitioner in the country often does, let the patient wait for a year or so before making dentures for them. The writer has yet to see many cases for which impression technique could produce a fairly permanent result when the osseous tissues had not completely regenerated. The trimming off of spines and reduction of the buccal plate in anticipation of future loss of tissue even when conservatively done has had no saving grace when applied to patients past forty, except to eliminate some immediate soreness.

Thickness of healthy mucosa is probably the most important

single factor in successful denture construction and the hardest to adequately describe. Not the least function performed by the mucosa is the way in which it adjusts itself to an impression to fill up defects that would permit air to enter under the seated impression, as well as a like adjustment to unavoidable slight inaccuracies that usually exist in the fit of the bases of the most carefully constructed dentures.

Insofar as retention is concerned, the thickness of mucosa on which the peripheral margin of an impression seats seems to determine the degree of retention possible. When the mucosa in this region is of such thickness that it may be indented about one-half to one mm. without pain, and when the mucosa covering the alveolar ridge internal to the peripheral region is thin enough to permit the least degree of rotational movement of the impression, we have the ideal condition for maximum retention and stability of a denture.

Impressions of mouths presenting conditions such as described, regardless of ridge form, present few problems for the impression novice. When, however, the peripheral tissue presents a break in the continuity of yielding area by the interposition of hard areas, the condition as respects impression technique is quite different.

Excessive soft tissue, especially when located in the mandibular alveolar ridge crest area or when covering most of the anterior third of the maxillary ridge and palate, presents a particularly difficult problem, and especially so if the posterior section of the palate is covered by a thin mucosa of drumhead consistency. The presence of much soft tissue on the crest or overlying in folds the lingual margin of the mandibular ridge is also a decided interference with ideal results.

Efforts made in early experience in this field to displace or compress such excessively soft areas, or the resorting to surgically removing such areas, have on afterthought been discontinued. Such soft tissue conditions when localized are the result of trauma or cover low grade infection. If radiographic evidence shows infection, such as demonstrated by Colburn and Jackson, is present, it should be removed and with it a sane amount of the soft tissue. When an excessive amount of the soft tissue is removed the resulting dense scar is often worse to contend with than the original soft tissue.

Efforts to reduce this tissue by pressure are usually unsuccessful, in fact they supply another type of traumatizing influ-

ence that seems to aggravate the trouble, and this is especially so if the soft areas cover infection which the patient declines to have removed.

Impressions should be made so that but slight pressure will be sustained by such areas or they should be relieved, for compressed soft tissues retain their stress resisting form only while pressure is applied to the denture and at other times expand and partly unseat the denture.

It is much better practice to obtain a secure bearing on adjacent hard areas in the palate and on the bucco-labial surface of the alveolar ridge than to attempt to compress soft, flabby or cartilaginous pendant tissues. This idea may with advantage be carried out with extreme cases by omitting relief on the anterior surface of the median palate, especially if the alveolar ridges are much resorbed.

The most difficult tissue condition encountered is met with when a thin, hard, drumhead-like mucosa covers the entire denture base area of the mouth and terminates in a mucous membrane pocket between lip and cheek covered by tissues of similar consistency and accompanied by several frenum-like bundles of dense tissue arising from the peripheral seat area of the ridge in the tuberosity regions, the bicuspid regions of the upper or lower and in the frenum-lingui and frenum-labii regions of the lower. Such mouths are usually most easy to treat by using a muscle trimmed approximate fitting tray and plaster. The periphery of the finished denture may have to be made of a velum like rubber called Flex-O-Tite to supply in the flanges of the denture the slight resilience necessary to secure valve seal. In such cases the writer does not hesitate to employ the old vacuum chamber rather large in area and shallow. The scratching of a retention line in the periphery of the maxillary cast about two or three mm. in from the peripheral edge of the impression may help as a last resort.

Scanty or thin saliva usually spells trouble in securing retention, and aggravates the difficulty when accompanying a hard mucosa. In describing the liquids present in the oral cavity some teachers apparently include the mucinous discharge from the tissues of the hard and soft palate. This is not correct. Excessive discharge of mucin from the tissues of the palate is often a very decided interference with the ultimate success of denture retention affecting those dentures under which such discharge is observed to occur, and is usually

stimulated by the insertion of a new denture. Saliva discharged from the salivary glands rarely causes any trouble except when there is little of it. No successful remedies for overcoming scanty saliva or continued excessive mucin discharge are known to the writer. Fortunately mucin discharge usually ceases if the patient continues to wear the denture. When the mucinous discharge is present in the mouth at the time of impression making it should be carefully swabbed away before the impression is taken and during the process of correction if the correctable technique is employed.

The size of the denture base area is relative to the size of the patient and usually is not a very important factor in impression technique prognosis, for this reason. When a very small, flat upper is related to a large lower the problem has to be worked out in the mechanics of denture construction rather than in the impression technique.

The form of the ridge area should be surgically corrected if prominences exist that interfere with peripheral adaptation. In correcting ridge form to permit the best results in impression retention do not advise changes that interfere with esthetics or that increase difficulties due to ridge relation in central occlusion, such as cutting away prominent lower ridge with or without teeth present below. The greatest caution has to be observed in such cases, as the subsequent restoration of expression necessary may subject the base area to unnecessary strain if much reduction of tissue occurs.

The invisible factors that ultimately, in the mind of the patient at least, lead to questions concerning impression technique efficiency are: Invisible irritants within the tissues covered by the denture. The health and resistance of the patient. The natural or acquired resistance to pressure of the tissues to be covered by the denture.

Invisible irritants within the tissues that support a denture may be in part disclosed by good radiographs. Such irritants as impacted teeth, pieces of root or particles of broken fillings have caused trouble that was at first attributed to faulty impression technique. The removal of the irritants remedied the trouble.

Infection that is not removed or if removed, recurs, accounts for many a sore spot and many cases of lost retention that no impression technique can care for in advance. When continued localized recurrence of irritation or atrophy occurs

over a period of months or years despite careful procedure there is little hope that it may be ended without opening up the tissue to find out what is wrong.

The patient who has, by circumstance, been forced to part with teeth decayed and aching, but with no periapical infection, is a much more favourable case for full denture treatment, both as regards immediate comfort and relative permanence of results after the first year has passed, than the one who has had extensive dental treatment including many root fillings followed by periapical infection preceding or determining the resort to extraction.

The mothers that some of our patients tell us about, who wore one set of dentures for forty years, were no doubt in the former class, while the daughter who relates this story is probably telling it because she is in the latter class.

Experiences with these two classes of patients may give the general practitioner much food for thought as to whether he should jeopardize the patient's health and future comfort with artificial dentures by treating and retaining doubtful teeth in an unfavourable environment.

Ill health and lowered resistance of a patient should be an index to warn you against efforts to produce great retention. The best that can be done for sufferers from chronic, systemic disease is to reconstruct the dentures when irritation requires, avoiding any procedure that might cause traumatizing pressure.

The resistance to change under pressure of the tissues covered by a denture may be very slight in patients who have worn ill-fitting dentures for many years. The increased pressure placed upon supporting tissues by the increased use a patient can give well made dentures sometimes stimulates a resorption that causes looseness or loss of retention in a few months. When this occurs do not think that the impression is entirely to blame. You may be surprised to find that a second set of new dentures will continue to function for a long time when made in exactly the same way as the first ones. The only way to account for the repeated occurrence of such experiences is to credit the tissues with acquiring a resistance to the increased use they are put to in the interval that the first dentures are worn. Care in impression technique may help to reduce such cases, but no amount of care can eliminate them entirely.

When we review the many causes for loss of retention which

the writer believes have been commonly laid at the door of impression technique, in the disappointment that followed their pernicious effects, we should be urged to apply rational procedure to impression technique. We will not act amiss if we proceed always with the feeling that the less stress we create on tissues from any cause, the more permanent will be our results.

Technique that may yield impressive results of a qualified permanent character in one case may be productive of rapid destructive change in another. The sane method of procedure is to adopt a technique that will be productive of the least inequality of pressure on the stress bearing tissues. Spectacular results in impression technique are usually the result of a procedure that produces unnecessary pressure on the soft mucosa, especially on the palate tissues of the maxillary arch. After many experiments with methods that promised the conservation of time over the usual muscle-trimmed impression in compound, the writer still feels that the choice of those who used an approximately fitting tray filled with a thin layer of soft compound, rather than a hard mass of compound, the surface of which is heated, was wise, whether by chance or intent. The results obtained with the former technique are not so spectacular always as those obtained by the latter, but the results in the mouth are more likely to continue to meet the requirements after several months or years. In addition, no false expectations, impossible of continued fulfilment, are aroused in the patient's mind.

Whether the impressions are made in compound or plaster, the results recounted lead to the conclusion that an approximate fitting tray filled with a small amount of plastic material will produce the most permanent results.

Some new materials, produced by one of the oldest manufacturers of compound for impressions, the Detroit Dental Manufacturing Company, have been found of considerable value. A new soft tracing stick, identified by a green colour, is used for correcting defects, building up the margins of impressions to produce valve seal and to prepare for muscle-trimming. It is soft enough to trim readily without undue heating and to obviate some of the danger of producing too great pressure on the bucco-labial periphery, a frequent error in the use of the regular tracing stick. A second material made available from the same source is a maroon coloured compound,

setting harder than the regular variety, which used either straight or mixed with the regular, sets hard enough to retain its shape at mouth temperature during tracing or muscle-trimming without tedious cooling precautions.

The writer continues to find compound, correctable, impressions the most satisfactory for the majority of his impression work, as this technique lends itself best to special treatment of varying tissue depth frequently found to be the cause of difficulty in securing retention. It also resists admixture with saliva, an advantage appreciated by those who take time to use it properly when dealing with the mandibular ridge. Plaster has its place, particularly when impressions of hard surfaces are to be made. Here it is the most satisfactory, and especially so in the construction of removable and fixed bridges.

Whenever appliances are constructed to be supported by the mucosa, compound is the best material. When clasps are employed as retainers compound may be used in conjunction with plaster which is employed to take impressions of the teeth to be clasped.

In recapitulation:

There are many factors that may cause loss of retention of dentures that are not traceable to impression technique.

The use of tight fitting impressions as a means of avoiding the labour of securing correct centric and other occlusions in the finished dentures is a snare and a delusion.

Impressions should be obtained with the least pressure possible and consistent with securing adaptation of the material to the mucosa.

Instead of trying to create stability of dentures by compressing soft tissues to a degree of rigidity sufficient to afford a firm foundation, relieve pressure on the soft areas and secure stability by getting bearing of the impression on adjacent hard areas.

Do not overlook the fact that after extraction the alveolar ridge tissues usually continue to wash away for a year and a half, causing in the meantime much annoyance to the patient which the dentist should not feel obliged to continue to treat without compensation.

Surgical Conditions in the Mouth in Relation to the Dental Practitioner*

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THE field of the dentist in regard to remedying defects of the teeth and their investing tissues is well defined. But in the broader field of pathological conditions in the mouth and surrounding parts, perhaps demanding surgical treatment, or perhaps requiring a knowledge of pathological processes of the body as a whole, the functions of the dentist are not quite so well established. In discussing this question we might begin by acknowledging that the fundamental bases for all rational treatment are a knowledge of pathology and the making of a correct diagnosis. The dentist, to be a safe practitioner, must be a good diagnostician, and in order to be a good diagnostician must have a knowledge of the pathology not only of the teeth themselves, but also of the surrounding tissues of the mouth and adjacent parts. Ability to mechanically place a beautiful filling or piece of bridge-work is essential, but this becomes useless, and may be dangerous, if the dentist ignores the pathological conditions about the apex of the tooth selected for such restorative work.

The dentist is often the first to see lesions in the mouth and adjacent parts upon the early diagnosis of which may depend the life of the patient. Even though he limits his practice to routine dentistry he should be able to recognize conditions which demand surgical attention. Although an intimate knowledge of technical surgical treatment is not necessary, he should know in a general way what can be done in surgical conditions of the mouth. As an example, the dentist should have a good idea in cleft palate when the patient should be referred for operation rather than be supplied with an obturator, but need not be familiar with all of the details of cleft palate operations. He should know how to go about the differentiation of a chancre of the lip from an epithelioma, but need not be expert in the intravenous administration of arsphenamin. A tuberculous gingivitis in the beginning may have many characteristics of pyorrhœa—the formation of pockets around the

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necks of the teeth, suppuration, and loosening of the teeth. The tuberculous condition, however, will grow progressively worse in spite of local treatment and the gums will not heal after extraction, but ulceration and destruction will continue. We have seen cases of this character which were regarded as ordinary pyorrhœa, but which were finally referred because the gums would not heal after extraction. Inasmuch as tuberculous ulceration of the mouth usually means tuberculosis farther down the respiratory tract, the importance of its early recognition is obvious. I need hardly remind you, also, of the importance of recognition of early cancer and precancerous conditions in the mouth.

In investigating a particular case of disease in the mouth or adjacent region for the purpose of diagnosis, the beginner at least should have firmly fixed in his mind a definite order and method. As he gains experience he will be able to suit his examination to particular cases that present themselves, but at first the definite rules should be adhered to in order that nothing of importance be overlooked.

The routine employed in arriving at a diagnosis consists in the following steps:

1. *The history of the patient.* This includes name, address, age, sex, social condition (single, married, widow), nativity, occupation, chief complaint, habits, etc.; history of present trouble; family history; previous medical history.

2. *Examination of the affected part and adjacent region.*

3. *General physical examination.*

4. *Laboratory examinations.*

1. HISTORY OF THE PATIENT.—One of the first questions to be asked the patient is regarding his chief complaint, i.e., the trouble for which we are consulted, which immediately draws our attention to the site of the disease and the line of investigation to be adopted. Probably most frequently the chief complaint will be pain, of a certain character, in some particular region. In other cases it may be the presence of a swelling, of an ulceration, of bleeding, and so forth.

The age of the patient is important in many cases. Cancer usually appears in middle age and old persons.

Sex. Cancer of the mouth is much more common in men than in women, so is leucoplakia.

The occupation sometimes affords an important clue to the diagnosis. Several forms of metallic poisoning with manifesta-

tions in the mouth are acquired directly through the occupation of the individual, e.g., lead poisoning.

Habits. Chronic irritation of the mucous membrane of the mouth is frequently produced by excessive use of tobacco. Persons of unsanitary habits of living are more predisposed to mouth infections than those who pay more attention to personal cleanliness.

History of present trouble. The patient should be questioned as to when and how the disease began, its rate of growth, whether painful or not, character of pain, other subjective symptoms, previous treatment if any, whether getting better or worse. Benign tumors increase in size very slowly, may be present for several years, are usually not painful. Malignant tumors usually give a history of only being present a few months or weeks, grow rather rapidly, and are usually painful. Inflammatory conditions usually have only existed for days or weeks, undergo almost daily change, and are painful. In malignant tumors and tuberculosis there is usually loss of weight and strength, and inquiry should be made as to the general health of the patient.

Family history. Valuable information can sometimes be obtained by inquiry as to the parents, whether living and well, or if dead, cause of death. The same applies to sisters and brothers, and children. Tuberculosis of parents or members of the immediate family is of great significance as denoting probable constant exposure of the patient to infection. In a child suspected of congenital syphilis, the parents should be examined for this disease.

Previous medical history. In a case of a suspected late or tertiary syphilitic lesion, inquiry may reveal that the patient has had a primary sore and other manifestations of syphilis. A history of several still-births in a woman is very significant of syphilitic infection. In suspected tuberculous ulceration of the mouth, the patient may give a history of suffering from a cough or other symptoms of pulmonary tuberculosis for a considerable period of time.

2. EXAMINATION OF THE AFFECTED PART AND ADJACENT REGION.—The affected part may show a swelling or an ulceration, a sinus discharging pus, or a bleeding area. In the case of a swelling, the size, shape and colour are noted by inspection. By palpation one determines whether the swelling is hard or soft, whether it has an elastic feeling,

whether fluctuation due to fluid is present, whether there is tenderness, whether there is undue warmth. In the case of ulceration, the number of ulcers present, the shape, depth, colour, regularity or irregularity of edges, size, etc., are determined by inspection. Palpation reveals whether the base of the ulcer is hard or soft, tendency to bleed easily, tenderness. The origin of a sinus discharging pus may be determined by probing. The general condition of the mouth, teeth, gums, tongue and tonsils should be noted. The neighbouring lymph nodes should be examined. If enlarged, the character of the enlargement as to size, tenderness, etc., may be important. Trismus, or acute limitation in opening the mouth, is an important sign of acute inflammatory conditions about the molar region of the mandible. Often in swellings or other abnormalities around the teeth, tests for pulp vitality should be made.

3. GENERAL PHYSICAL EXAMINATION.—It is not expected that the dentist should become proficient in making examinations of the heart, lungs or other parts of the body, but he should know when such examinations would be of advantage in throwing light on manifestations of disease in the mouth, and the general meaning of such examinations. The temperature, pulse, respiration and blood pressure findings are often of significance. The colour and general nutrition of the patient may be affected by abnormal conditions in the mouth. In late carcinoma there may be a peculiar pallor (cachexia) from toxic absorption, together with anæmia and emaciation. Certain diseases have skin manifestations in addition to mouth symptoms. Among these are pemphigus, lichen planus, scurvy, and syphilis. In late syphilis, in addition to mouth lesions, scars or marks of syphilitic lesions may be found in other regions of the body. In suspected tuberculous ulceration of the mouth, the patient is usually emaciated and anæmic. Examination of the lungs may reveal evidence of tuberculosis there, as the mouth condition is nearly always secondary to the lung disease. In cases of persistent hemorrhage from the mouth, generalized enlargement of the lymph nodes, or of the spleen, may lead to further investigation as to whether leukemia is responsible for the hemorrhage.

4. LABORATORY EXAMINATIONS.—These include radiographs; blood; serologic; urine; bacteriologic smears, cultures, animal inoculation; examination of tissue.

Radiographic examination is an invaluable means of diag-

nosis in practically all lesions involving bone and teeth. By pathological laboratory methods we are very greatly helped both in the diagnosis of the lesion itself and also in forming an accurate idea of the general condition of the patient. The latter knowledge is obtained in part by examination of the blood, by which we determine the presence of anæmia, and whether the patient has the power to resist the infection whatever it may be. In suspected leukemia, much depends for diagnosis on the blood picture. Examination of the urine gives information as to the condition of the kidneys, and also the presence of sugar, suggesting diabetes. A stubborn case of pyorrhœa may have diabetes as an underlying factor, revealed by urinalysis, and will yield more readily to local treatment by placing the patient on antidiabetic regimen. As bearing directly on the diagnosis of the lesion present in the mouth, certain laboratory procedures are of especial value. Smears and cultures examined bacteriologically may determine the nature of the causative agent, as the spirillum and fusiform bacillus of Vincent, the spirochæta pallida in the primary stage of syphilis, streptococcus infection, actinomycosis, etc. Inoculation of guinea pigs with scrapings from a tuberculous ulcer may be necessary before the diagnosis is established. A portion of the tissue from a tumor or edge of an ulcer may be removed under local anæsthesia and the diagnosis made by microscopical examination. In the secondary and later stages of syphilis, the diagnosis may be made by the presence of a positive Wassermann reaction in the blood serum.

The foregoing indicates briefly the various measures that may be carried out in diagnosing pathological conditions in the mouth. For diagnosis it is of course not always necessary to perform as complete an examination as outlined. On the other hand, cases are occasionally met which baffle the most exhaustive measures of investigation.

Conditions sometimes requiring care in diagnosis are manifested in acute inflammatory swelling in the submaxillary triangle. These acute swellings are most commonly due to extension of dental infection. The pus of an acute dento-alveolar abscess in the lower jaw frequently perforates the bone high up opposite the root of the tooth, in which case the abscess points into the mouth. If the bone is perforated low down, however, the pus will strip up the periosteum for a varying extent and then pass into the soft tissues of the submaxillary triangle, gradually approaching the skin. Sub-

maxillary abscesses of this nature, therefore, as Sebileau has pointed out, are due to direct extension from the periosteum and bone and are not purely a suppuration of the lymph nodes as commonly taught. A very valuable sign that an acute swelling in the submaxillary region is of dental origin is trismus or limitation of opening of the jaws. This is practically always present in acute inflammatory involvement of the bone and periosteum around the molar teeth, and in its absence other causes for the submaxillary swellings should be sought, e.g., tonsillar infection, or ulceration of the soft tissues of the mouth, etc. Another condition causing acute or subacute swelling in the submaxillary region which is commonly mistaken for a lymphadenitis or cellulitis due to dental infection, is enlargement of the submaxillary salivary gland from obstruction of Wharton's duct by a calculus. In most of the cases that have come to us the patients have been told that the trouble was due to infection from the teeth and have had one or more teeth extracted without relief. The patient will generally give a history of several previous attacks, with increase of pain and swelling especially during meals. In addition to the tender circumscribed swelling in the submaxillary region, there will usually be a painful swelling in the floor of the mouth, and difficulty in swallowing. Trismus is usually absent. A tender nodule—the calculus—may be felt somewhere along the course of the duct in the floor of the mouth by combined intraoral and extraoral palpation. The diagnosis will be confirmed by x-ray examination. A No. 2 film ($2\frac{1}{2} \times 3\frac{1}{4}$ in.) is placed in the bite position between the upper and lower teeth as far back in the mouth as possible, with the sensitized side down and the rays directed from beneath the chin. A calculus in the anterior three-fourths of Wharton's duct will cast a shadow on the lingual side of the teeth and jaw. If the stone is farther back, near the beginning of the duct, a lateral extraoral film may be required to show it. The extraoral method of examination for small stones in the anterior part of Wharton's duct is generally unsatisfactory, as the stone shadow may be covered by that of the mandible.

Many other examples could be given to illustrate that this diagnostic function constitutes one of the relations, perhaps the most important relation, of the general practitioner of dentistry to surgery. Closely bound up with accurate diagnosis is the ability to estimate which cases the general practitioner himself

is capable of handling and which to refer to a specialist from the beginning.

As to the actual scope of the surgical procedures that come within the field of the general practitioner of dentistry this depends in part upon whether he is practising in a small town or in a large city. In a small town, conditions may prevent one from devoting all of his time to oral surgery, so that here the general practitioner might be expected to perform many minor surgical operations in the mouth which in a large city would naturally be referred to a specialist. So that it is difficult to lay down hard and fast rules to cover all conditions. Every dentist who contemplates doing much oral surgery should by all means associate himself with a hospital. A hospital internship furnishes the best possible training for this work. By this association with general surgeons and medical men and sick patients, experience is gained that cannot be obtained by years of office practice.

There is no question that every general dental practitioner should be familiar with the technique of tooth extraction. For this it is entirely unnecessary to have the extensive equipment, large array of forceps, etc., that one sees in the establishments of our friends the exodontists. The aim should be quality of the work done rather than quantity performed in a given time. Nothing is less in accord with modern principles of surgery than the haste often exhibited in removal of eight or ten teeth under nitrous oxide anæsthesia. Roots are frequently broken off and left behind, gums are torn, and projecting jagged edges of alveolar process are left for slow absorption by nature. In the opinion of the writer, local anæsthesia by procain-suprarenin is the method of choice for the routine extraction of teeth. With this method the operator can do his work with deliberation and accuracy, being unhampered by excessive bleeding and limited time. He can avoid undue laceration of the gum tissue, curet as much as necessary, trim off excessive alveolar process, and, if necessary, place a suture here and there to protect the exposed bone with soft tissue, so that healing will take place rapidly and smoothly, with no prolonged waiting for absorption to take place before artificial dentures can be worn. It is entirely unnecessary in routine extraction work to resort to the so-called surgical flap method and alveolotomy. This method is very useful in its place, but should be reserved for cases where it is desired to obtain full exposure for curetting a periapical area of disease in the

bone or for the removal of broken off roots which cannot be readily grasped with the forceps or elevator without damaging the bone.

The most important factor in connection with local anæsthesia is the observance of strict asepsis. Only syringes and needles that can be conveniently sterilized by boiling each time before use, should be employed. No dependence should be placed on flaming the needle alone without sterilizing the syringe. The keeping of syringes in solutions of alcohol and glycerine or other chemical methods should not be relied upon for sterilization. One can never be certain that the interior of the syringe is sterile under these circumstances. The sight of the so-called sterilizing jar for syringes in the dental office gives one the same feeling as that of the "Antiseptic Sterilizer" case in the barber shop. It may have a psychologic effect on the lay mind.

The dental practitioner is often confronted with the problem of dealing with acute dento-alveolar abscesses and complications arising therefrom. The development of such an abscess is usually the fault of the patient, or of the parents if the patient is a child, for neglecting the teeth until an abscess forms from a dead pulp. Subsequent complications, osteomyelitis, periostitis, cellulitis, etc., are frequently fostered by the application of a flaxseed poultice to the face. The dentist is usually blamed if complications arise, regardless of the course he pursues. If he extracts an acutely abscessed tooth, and bone infection develops, it may be claimed that the extraction caused the infection to spread. If the dentist does nothing, and osteomyelitis occurs, he is then blamed for not removing the tooth. While as a general proposition it may be said that the abscessed tooth should be extracted, yet I believe there is in the individual case an opportunity for the exercise of judgment as to just when to remove it. The principal point is to establish drainage early by an incision to the bone. If the case is in the fulminating stage, before frank suppuration has set in, with resistance low, extraction at that time may do harm. If, however, pus is seen welling up around the tooth, or there is a distinct collection beneath the surface of the tissues, drainage may be greatly aided by extraction. One thing is certain, if the dentist who sees a case of this kind is unwilling to accept full responsibility for the consequences of his advice or treatment, he should refer the patient to some one whose experience makes him competent to handle the case in all of

its phases. After extraction in a case of acute abscess, the socket should never be curetted, as the infection will probably be spread by this procedure. Where the dento-alveolar abscess points into the mouth, drainage can usually be accomplished by an incision through the gum. Drainage of a dental abscess pointing in the submaxillary region is best effected by incision through the skin, beneath the lower border of the jaw, usually under gas anæsthesia. Made carefully, the incision leaves but a trivial scar after healing. Under this treatment, the majority of cases of acute dento-alveolar abscess get well in a short time. Sometimes, however, the pus, instead of making its exit through a perforation in the bone, near the point of origin, spreads through the cancellated tissue of the mandible, causing osteomyelitis. In children, the follicles of unerupted teeth are very favourable to the development of osteomyelitis. In other cases the periosteum is stripped off the bone to such an extent as to destroy the vitality of a certain portion. In either case, some of the bone will die. When it is evident that some necrosis will occur, waiting for the separation of sequestra by natural processes brings about far better end results than radical removal of the diseased bone. By attending to proper drainage and cleansing by irrigation and then removing sequestra as they form, it is possible to have the lost bone almost completely replaced by new bone, with avoidance of great deformity and interference with function. On the other hand, if the diseased bone is resected before complete sequestration, there is generally great interference with regeneration, resulting in unsightly distortion of the face, malocclusion of the teeth, or non-union of the remaining portions of the bone. In many cases, much can be done to preserve the natural contour of the bone and the normal occlusion of the remaining teeth by the application of suitable splints or ligatures to the teeth before the removal of sequestra, so that after the dead bone comes away the remaining portions of the jaw will not collapse, but will stay in proper position until new bone formation fixes it permanently. Where this has not been done it may require a series of operations or prolonged orthodontic treatment to even imperfectly approach normal conditions.

If space permitted, several other phases of this subject could be dealt with, such as the relations of the maxillary sinus to the teeth and mouth, tumors of the mouth and jaws,

fractures, root resection, etc. It is especially desired to emphasize that if the dentist knows his pathology and knows how to go about making a correct diagnosis, the question of surgical technique can be left for secondary consideration.

A Study of Bacteria in Living Pulps in Relation to Grinding Teeth in Periodontia*

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HERE are two problems which dentists have had before them for the last few years and which did not seem to have a great deal of relation one to the other, so far as most of us could see. However, the results of the investigation related in this paper seem to link them together. The first problem was the possibility of harm as a result of grinding the enamel off the teeth during treatment for peridontoclasia. The other problem was the problem of teeth being an original focus of infection in different parts of the body.

Originally my investigations were directed towards the solving of the latter problem, but my interest soon changed and I examined only those teeth which had living pulps.

Examination of teeth having no vital organic tissue left in the pulp chamber, and also the tissue which surrounded these teeth, was being carried on by numbers of investigators and reports were being made to the profession. Some of these reports showed that sometimes the fluids discharging through sinuses contained no micro-organisms and at other times a variety of micro-organisms. We found much the same condition to obtain in the pulp chamber, that is, we failed to find at times micro-organisms in the debris found in the pulp chamber, and at other times we found more than one variety of micro-organisms. But as this study was not as interesting as the study of the pulp chamber which contained living pulps, it was eventually discarded. I am not prepared to say that some method other than the one that I was using might not have discovered micro-organisms in all of those cases of broken

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down pulps, but the ordinary strains of micro-organisms were often not there.

As this study proceeded I conceived the idea that it might be valuable in determining whether micro-organisms could find ingress into the pulp chamber by grinding the enamel off the dentine or otherwise. Therefore in the last eight or nine years, during which time I have been following up this subject, I have cultured, or have had cultured for me, over six hundred pulps of vital teeth, that is, vital teeth which have been extracted. At first I did all the work in my own laboratory, sometimes using the incubator of the College, and I found in the investigation that I was getting micro-organisms in 85% of all the pulps.

Interest increased as experience grew, and as this new field opened itself up to me I became increasingly careful to see that no extraneous organisms got into my material for culture. Therefore I evolved a technique designed to insure no contamination of my material. The technique which we used at that time was as follows,—The teeth to be used for the purpose of culturing, and which were always freshly extracted, were washed off with 5% hydrochloric acid. Then a groove was cut longitudinally of the root to accommodate the blade of the cutting forceps. Then the cutting forceps was sterilized, the tooth grasped by sterilized pliers and split into a sterilized tray under the cover of another sterilized tray, the pulp or fragment of pulp removed by sterilized probes and placed in broth; this broth was then sub-cultured after a growth was obtained. However, we found that after taking these precautions we had practically as large a percentage showing growths as when we were using blood serum and plain agar, and a less exacting technique. These results were so persistent and so different from what I expected that I looked for some outside assistance and criticism.

I applied to the Dental Research Committee of the University of Toronto to have the culturing done under their auspices, and my petition was granted. My method of obtaining the material and my technique for that purpose were considered satisfactory. We sent to the pathological laboratory and had reports on about thirty cases. In sending the reports of the cases, notwithstanding the fact that we had not deviated from our careful technique in obtaining the cultures, Miss Fraser, the technician of the Dental Research Committee of the University, said, in regard to several cases, "The case has

been contaminated by the flora of the mouth." Naturally such a comment aroused our curiosity, because we felt sure no such contamination could have taken place, and we found by investigation and observance that when such a report was made it was always regarding a tooth which had a very large cavity in it. Consequently we came to the conclusion, rightly or wrongly, that in some way micro-organisms were getting into the pulp through those cavities, notwithstanding the fact that so far as we could see there was not an opening from the cavity into the pulp chamber, and we always took care in splitting the tooth not to split into the cavity. That gave rise to a new thought, inasmuch as it seemed to show that dentine unprotected was porous to micro-organisms.

In a paper read before the International Association for Dental Research in New York in 1925, Dr. Charles Boedecker made the claim that whenever a cavity became established in a tooth so that the dentine was exposed, or where by natural attrition the enamel was ground off the dentine, in every such case secondary dentine was deposited in the pulp chamber in such a way that it blocked the tubuli of the dentine leading from the exposed dentine to the pulp chamber. And Dr. Boedecker showed slides and specimens which proved his case. Now we know that this secondary dentine deposited in the pulp chamber is a very homogeneous mass, containing about 1% the number of tubuli ordinary dentine does. Knowing these facts, and knowing that when you expose the dentine by grinding the enamel off the tooth, as is done in treating for so-called traumatic occlusion, the tooth has no chance of building up this protective secondary dentine, I believed that we were taking great risks of allowing micro-organisms to penetrate through the tooth into the pulp and probably into the circulation by unnecessarily and violently exposing the dentine of the tooth, and that we were increasing the danger by using sulphuric acid to dissolve out the contents of the tubuli of the teeth which had been ground, and which practice was regularly resorted to.

Another thought seemed to be the direct result of this reasoning, and that was if you had not a break in the enamel or cementum and they were in contact with one another you could not have micro-organisms in the living pulps of teeth. Consequently, to investigate this theory I have carried on for ~~over~~ a year a series of experiments in St. Michael's Hospital, Toronto, under the direction and the rules of the pathological laboratory of St. Michael's Hospital.

William Magner, M.D., F.A.C.P., D.P.H., who is the pathologist of St. Michael's Hospital, was good enough to take a very keen interest in the work which I proposed to have carried on in his department. He, having the interest of his patients in the Hospital at heart, entered into the investigations whole-heartedly and has helped us and is helping us in every possible way—personally supervising the work and making the cultures and sub-cultures. We followed the technique approved of by him in getting our culture material, that is to say, after the tooth has been extracted it must be covered with alcohol and that alcohol burnt off not only once, but this must be repeated at least three times. The operator who splits the tooth to remove the pulp which is placed in sterile broth, must wear a sterile cap, sterile gloves, sterile gown and a mask, and of course all the forceps and instruments must be freshly sterilized. After the specimen is placed in the broth it is immediately transferred to the incubator.

In this work in St. Michael's Hospital we have used only teeth which so far as we could see by careful examination are normally shaped teeth with not a break in the enamel or cementum. In other words the dentine is perfectly covered, and teeth of this kind are not easy to get. Many times we have found that specimens which we thought on casual observation were alright, on examination showed a break of some kind and they had to be discarded. However, up to the present time we have been fortunate enough to get forty-two teeth which were satisfactory and, to my great surprise, and opposite to what I expected to find, 65% of these teeth proved to contain micro-organisms in living pulps. One might be led to believe because we were working in a hospital that these teeth were all extracted from patients suffering from some constitutional disease and that thereby we would get a key to the mystery, but that is not true. Several patients were outside cases who had no hospital history until we obtained it. The teeth had no cavities and they did not necessarily have advanced periodontal trouble and the enamel was not ground off either by attrition from mastication or artificially. Let me say that regarding periodontal trouble the mouths are always examined by Dr. Rutherford, who is head of the dental clinic at the Hospital, as well as by myself, and we have not found that it was necessary to have periodontal pockets or gingivitis, and so far as we could see there was

nothing to suggest that the gingival tissues contained micro-organisms. Of course you are well aware that the experiments of Dr. Hartzell and Dr. Simmons have proven that micro-organisms are found in the gingival tissues even in fairly healthy looking specimens, consequently one cannot be too positive in this regard. On the other hand, it is a fact that in our experiments we have found a number of cases where there were deep pockets and no micro-organisms in the pulps, and other cases as above said where there were no apparent pockets and pure culture micro-organisms were found in the pulp.

We have not desired or asked for a minute segregation of the micro-organisms found; however, Dr. Magner has been good enough to give us some detailed information in this regard. He has found that the organisms most often recovered are streptococcus veridans; but other organisms are also found, the next in order being the staphylococcus aureus. There was one case which has great significance and which to all concerned was a matter of wonder and gratification. A patient two weeks after having had an appendiceal abscess operated on, presented himself to have some teeth extracted, one of which was a perfect specimen for our work. Upon culturing the pulp of that tooth Dr. Magner found the bacillus communis coli. This evidently demonstrates that the bacillus was either still in the blood two weeks after the operation, or else it was protected and preserved in the pulp of that tooth. It certainly reached there through the circulation. Of course we would be justified in making the same claim about all the other micro-organisms found in those pulps, but this being an unusual organism to find in the blood immediately draws one's attention to the source of the micro-organisms in the teeth, and we are certainly justified in conjecturing that selective organisms found in devitalized teeth and in areas at the apices of teeth have their origin a long distance from the teeth. In other words, instead of the teeth being the original focus of infection for, say kidney, heart and other lesions, the organisms have travelled from the kidney and the heart and lodged in and around the devitalized teeth. Now this does not mean, as I see it, that those devitalized teeth harbouring these selective organisms are not a menace to the health and life of the patient, because so long as they are in that condition they can re-infect the infected tissues; but it does mean that there

are hundreds of cases of devitalized teeth having areas and containing micro-organisms which are doing the individual no harm, but that if these micro-organisms are replaced by organisms obtained through the circulation which are pathogenic to the patient, the teeth are then a source of danger. It also shows us why we often find that extracting teeth has only a temporary beneficial effect on the patient. That is to say, as the teeth are not the original source of infection, it is necessary not only to extract the teeth, but the original source must be found and eliminated.

Just at this point let me draw your attention to another truth which these investigations have shown us, and that is that you can have a devitalized tooth doing no harm to the individual and you can have a vital tooth a focus of infection; and so called neuralgia pains from teeth with large fillings that have been in for some time may be and probably are the result of micro-organic irritation in the pulp. It also demonstrates, if demonstration were necessary, that if you fill or nearly fill the root of a freshly devitalized tooth with copper amalgam or any similar substance, which substance will not allow micro-organisms to grow within two mm. of it, if you fill the roots I say with such a material, you cannot have that tooth infected from the circulation. Does this not go a long way to solve the problem of focal infection from devitalized teeth?

Because we have been trying to get teeth for our work as nearly perfect as we could find, the number of these teeth reported on is comparatively small, and one is apt to lose sight of the fact that also embodied in this paper we have a report of hundreds of other teeth, many of which had but small cavities, some scarcely more than a strain. Consequently if we take all of these into consideration we have a large amount of data to depend upon, because I do not believe that with secondary dentine formed in the pulp chamber any small cavity increases very greatly the likelihood of micro-organisms penetrating the dentine, and notwithstanding the fact that recklessly exposing the dentine by grinding or otherwise is to be very much deplored. Nevertheless, in the hands of careful experienced operators, grinding the enamel off the teeth to correct occlusion is not fraught with any danger to the patient.

We have in this work discovered what seems to be an

important fact, if it is borne out by further investigation, namely, that teeth which have through one cause or another had secondary dentine deposited to such an extent that the pulp was very much reduced in size did not contain micro-organisms, and that teeth the apices of which were so highly calcified that they were nearly transparent also did not contain micro-organisms. Usually these conditions were connected with advanced periodontoclasia, or rather the result of alveoloclasia. That is to say the bony investing material of the teeth had partly disappeared, so that the teeth were loose but vital,—in fact in some cases the periodontal tissue had been stripped from the root for more than half its length. On the other hand, large functioning pulps were prone to contain micro-organisms. Consequently, you can see that an investigator can very easily influence the percentage of teeth containing micro-organisms by the kind of specimens he chooses. Peculiar as it may seem, in a number of cases in the same mouth and under the same condition as far as we could see, we could recover micro-organisms from one tooth and not from another. We have met several of these instances. I have here a report of one such case of a girl nineteen years old. There are some features about it that might be of some interest to you, and I will make a full report of it on that account, and also read Dr. Rutherford's remarks. I am also showing here an x-ray taken by the Hospital, showing the very unhealthy condition of the mouth of this patient from whom we took two teeth, the bicuspid and cuspid in the lower jaw, and had a report that they were sterile.

In doing this work I have had very generous assistance from a number of sources. I want to acknowledge my gratitude to Dr. Marjorie Milne, Dr. Harry Thomson and Miss Fraser of the Dental Research Committee, also Dr. Rutherford, Dr. Gordon Frawley and Dr. Montgomery of St. Michael's Hospital Dental Clinic, and also to Dr. William Magner, Pathologist of St. Michael's Hospital, and to the Hospital itself, which has afforded us every facility for research. I am also glad to say that the work is still being carried on in this institution, and we have assurance of further help from the X-ray Department under Dr. Shannon and any other necessary assistance.

Formalin in Root Canal Therapy

DR. GREGORY FELDMAN, STATE UNIVERSITY OF MOSCOW.

Abstract and translation of report of experiments by Dr. J. Stanley Bagnall, Dalhousie University.



N experimental investigation on the action of Formalin in root canals, which was carried out by Dr. Gregory Feldman of the State University of Moscow, is a strong indictment of the use of this drug in dentistry. The report of his investigation is given in "Die Wirkung des Formalin and Tricresol-Formalin auf das Parodont bei Behandlung und Wurzelfüllung" (The Action of Formalin and Tricresol-Formalin on the Periodontium in the Treatment and Filling of Roots) in the *Deutsche Monatsschrift für Zahnheilkunde*, Berlin, May 1st, 1927.

Attention is directed to the fact that with the advance in methods and the application of biological ideas the focus of our attention in root canal treatment must be directed to the tissues around the root. "A treated tooth gives rise to a continual doubt as to what the eventual result will be, since on the one hand we are not protected from reinfection and, on the other, it is extremely difficult to foresee how far the harmful action of one or other of the media extends and what changes they have caused or may yet be able to cause."

A whole series of remedies has been proposed to disinfect the root canal, heal the damaged periodontium and protect it from the possibility of further disease. Buckley in his paper on "The Chemistry of Pulp Decomposition; with a Rational Treatment for the Condition and Its Sequelæ," given at the Fourth International Dental Congress in August, 1904, expressed his views on pulp decomposition and its treatment. "The initial process in decomposition of the pulp tissue is one of fermentation, brought about by the action of micro-organisms on the carbohydrate constituents, producing, among other compounds, such acids as carbonic and acetic. This creates an acid medium which favours the growth of micro-organisms and the process of putrefaction is thereby inaugurated. Hydrogen sulphide, putrescin and two isomeric substances, cadaverin and neuridin, are among the first products produced. As the

process goes on these later substances are gradually broken up and ammonia, or derivatives of ammonia, are formed. The fatty constituents remain practically unchanged during the whole process and exist in the putrescent mass. The bacteria may split up the neutral fats into glycerin and fatty acids, but no other changes seem to occur. The chief final products of pulp decomposition then are: Water, carbon dioxide, ammonia, acetic acid and a semi-putrescent substance, which is largely composed of fats. The treatment required is an agent which, in contact with the end products, will unite chemically, converting them into odourless and non-infectious compounds. Such a gas is formaldehyd, which occurs commercially in a 40% solution as formalin. Formaldehyd unites with ammonia to form urotropin (hexamethylene-tetramin), which is odourless. Formalin is too strong for general use and, since the fats remain unchanged, cresol is used in combination with formalin to act chemically on the fatty constituents. The cresol which is best suited is the tricresol, which is added to the formalin in equal proportions."

Dr. Feldman states that the Buckley method of root canal treatment was enthusiastically received. Some writers, as Scheuer and Haewer, advocated dispensing with a preliminary cleansing of the root canal and depended entirely on the tricresol-formalin preparation. Lartschneider, in 1909, published a voluminous work on the known methods of treatment for gangrenous teeth. He was not as enthusiastic at this time over the preparation as he had been earlier. Preiswerk-Maggi, G. Fischer and others, recommended the treatment, but insisted on mechanical cleansing and careful washing out of the canal.

A. Witzel, in 1907, showed the vagueness and inaccuracy of the chemistry of pulp decomposition given by Buckley. He stated that remedies had not been found which, on introduction into the pulp cavity, were able to arrest the putrefactive processes and liquefy the pulp remnants. The tricresol-formalin remedy, in his opinion, called forth a painful reaction of the surrounding tissues and necrosis of the alveolar process.

Mayerhofer, in 1909, stated that the idea that by the Buckley method gangrenous teeth are guarded against infection was only a pleasing illusion. The tricresol-formalin dressing in the root canal of a gangrenous tooth attains only a temporary sterilization of the canal. Baumgartner and Caspare investigated the remedy and agreed with Mayerhofer.

J. Grewe cautioned against the use of formaldehyd, since his experimental investigations led him to the conclusion that its irritating power was due to the ease with which it was volatilized. The penetration of the gas through the dentine tubules into the surrounding tissues can call forth an inflammatory process with pus formation and tissue destruction, in spite of the fact that no clinical complications are to be observed immediately after the treatment.

Blessing, in a report on experimental work on "The Bactericidal Action of Some Remedies Used in the Treatment of Putrescent Pulp," showed that tricresol-formalin is a quick and strongly acting remedy, which has no lasting antiseptic powers and is only suitable for temporary introduction.

Experience has taught us that the pericementum must be preserved from acute as well as from chronic irritation. Several investigators of recent years have expressly declared that it is time to desist from the application of strongly acting antiseptic remedies. Mayerhofer, Baumgartner, Blessing, Weinmann and others have proved that they give no lasting disinfection to the root canals and only bring damage to the periosteum.

With respect to the use of formalin preparations in the treatment of cavities in sensitive teeth, G. Gainin has described his clinical and experimental observations in which he found that preparations containing formaldehyd in 1-5% solution penetrate through the dentin and destroy the pulp tissue by necrosis.

"Confirmation has therefore been given by a series of experimental reports and clinical observations that formaldehyd and its preparations possess the property of diffusing through the dentin and setting up an inflammatory process. It is, however, important for us to know whether the preparations call forth changes in the periodontium in treatment and filling, what kind of changes they are, whether limited or widespread, temporary or lasting. What factors act to stimulate or hinder the development of pathological processes in the periodontium? To determine the answer to these questions a series of experiments was arranged on dogs." In one series a paste composed of zinc oxide and 40% neutral formalin was used. In another, a paste of zinc oxide with 2 grams of tricresol, 1 gram of formalin and 0.5 grams of glycerine. A third series with a paste of zinc oxide and tricresol, without formalin. A portion of the paste was placed on the floor of the pulp chamber (which had been opened into under general anæsthesia and

strict antiseptic precautions) and sealed over with cement. In addition, a portion of arsenic paste, about one-sixth the size of a large pin head, was placed in some of the premolar teeth. The application of the arsenic paste, in some cases of young dogs, led to the falling out of the teeth after an interval of 7, 15 to 30 days. In all, forty experiments were carried out on five dogs of different ages, in which the incisor and premolar teeth were chiefly used, with the control teeth situated between the two groups. Duration of the experiment was for 10, 21, 30, 45, 60 and 93 days. The animals were killed at the end of the test and the jaws so sectioned that sound and treated teeth were included in the same section.

First Series. A paste of zinc oxide and 40% formaldehyd solution used. Duration of the experiments, 10-21 days. The teeth used were incisors and premolars. The tissue changes around the incisors were not so marked as around the premolars. An interesting feature is the marked degenerative changes which took place in the tissue adjoining the root bifurcation in the premolars. There is infiltration of the connective tissue with lymphoid cells and, in places, metaplasia of the connective tissue bundles of the lateral pericementum into bony tissue. The far reaching tissue changes in this area, with absorption of cementum and dentin, point to some local condition causing an acceleration of the development of inflammatory processes. It should be remembered that the tooth structure is thinnest here and also forms the bottom of the pulp chamber, where the paste used in filling the roots lies. This creates favourable conditions for the penetration of the easily diffusible formalin.

Second Series. Paste consisting of zinc oxide with tricresol and formalin in the proportion of 2:1. Duration, 10-60 days. This series did not show any modification of the action of the formalin, by the addition of tricresol. The active agent of the formalin seems to escape through the tooth even in this mixture.

Third Series. Paste, the same as in second series. Duration, 45-93 days. The experiments in this series prove the assumption that the formaldehyd passes out through the sides of the roots. In some cases there were definite and very marked changes in the lateral pericementum, while the portion around the apex was quite healthy. In the first two series, where the experiments were of shorter duration, the destructive

changes ended in changes into bony tissue and moderately destructive processes. In this series there is copious pus formation, cementum and dentin absorption.

Fourth Series. Paste consisting of zinc oxide and tricresol-formalin (tricresol, 2.0 grams; formalin, 1 gram; glycerine, 0.5 grams). Duration, 93 days. Results obtained in this series were similar to those of the third. Inflammatory and bony changes in the periodontium were strongly marked, pus, in some cases, attacking almost the whole periodontium. Here, as in other cases, the thick, coarse pericementum is much less affected than where the pericementum is fine and delicate.

Fifth Series. Pure tricresol added to the zinc oxide, without formalin. Duration, 93 days. These experiments carried out on the same dogs as in the fourth series. The soft tissues were little affected in this series, the only changes being widely dilated vessels and some round cell infiltration..

Sixth Series. Arsenic paste for 2 days and then tricresol-formalin for 28 days. The destructive changes in this series far exceed those of the first series and approach more closely those of the third series, where the tricresol-formalin was applied for 93 days. There are more or less pronounced ossification changes, formation of pus foci, proliferating granulations from the pericementum eating out large areas of the roots. The increased damage in this series doubtless was due to the 2-day application of arsenic, which inaugurated favourable conditions for the action of the formalin paste.

Buckley based his theory on the statement that the ammonia, which constituted the end product of decomposition of the soft parts of the tooth, united with the formaldehyd solution to form the harmless urotropin; that the neutral fats were split up into fatty acids and glycerine and the fats present, in pulp decomposition, dissolved in the tricresol. Pulp decomposition is, however, a gradual event and has pus formation as an intermediate product. In the treatment of the gangrenous pulp we can never stipulate whether the decomposition process has reached the stage of ammonia formation, or only the intermediate stages. Then what happens to these intermediate products if the formaldehyd acts only on the ammonia? Williger also denied the possibility of the tricresol completely dissolving the fats. Therefore since the tricresol-formalin remedy does not affect the fats or the intermediate products, what end does it serve?

The effects observed by some writers where the tricresol-formalin has apparently cleared up conditions in putrescent root canals may be explained by the following facts. Teeth are frequently treated, under extremely unhygienic conditions, with absorbent cotton soaked in various antiseptic solutions and sealed in with some type of stopping which does not exclude moisture; the teeth filled and retained for one to three years after such treatment. Can such treatment be termed successful? Apparently it is. The tooth is painless, functioning and apparently quite sound; but bacteriologic tests show the presence of bacteria.

It has been established that about 60% of teeth possess curved roots which will permit the passage of the finest broaches. G. Fischer, in 1912, in describing the anatomy of the root canal, stated that in 90% of roots there is not one broad foramen, but numerous, fine, complicated foramina. The assumption that it is possible to remove all living or decomposed material from these curved canals and delicate openings is untenable. These remnants may be the source of disease in the periodontium because of their intimate contact with it. We apply chemical or mechanical cleansing to remove the pulp remnants, if possible, to bring the micro-organisms in the canal to a latent condition, but we can scarcely assume that by such methods a gangrenous tooth can be made sterile. Such teeth are merely placed in a "latent condition." We have not the slightest guarantee that the bacteria which can be found in the dentin will not again become active and invest the periodontium.

Formalin penetrates, as shown by the experiments, through the apical foramen, region of the bifurcation and the dentin tubules, so that after 10-21 days there is vessel engorgement, hyperæmia, infiltration with lymphoid cells and leucocytes, partial metaplasia of the connective tissue bundles of the pericementum into osteoid tissue. Later there is pus formation, resorption of the cementum and the dentin. The addition of even twice the amount of tricresol does not decrease the inflammatory process.

The periodontium is damaged by even small amounts of formalin, and the destructive process is still more marked where formalin is added to the paste used to fill the canal, especially if arsenic has been used on the tooth. The application of

tricrosol paste without formalin is apparently unharmed to the periodontium.

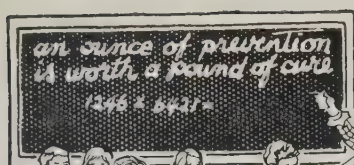
The results of these animal experiments cannot be applied directly to man, but these experiments allow us to follow the developmental progress of the factors investigated. While the tooth and periodontium in the dog are entirely different from those of man, still the fact that the formalin caused destructive changes of so pronounced a character argues its harmful action in man.

The expectations placed on formalin are quite unwarranted. The remedy is not based on scientific facts and the clinic and experiments have shown its widespread application to be unwarranted. When selecting remedies for use in treatment of canals attention must be paid to the possible effect on the periodontium.

Instrumentation in Surgery

“FROM an examination of the evolution of instrumental technique, one fact emerges clearly, that is the mechanical tendency of surgery. Whether it is a question of securing increased speed for the instrument in use, increasing its power to the highest degree, obtaining more precise geometrical work, so to speak, or substituting an automatic movement of the instrument for some of the operator's movements, the part played by machinery is ever and ever increasing, and in a very satisfactory manner. When it is a question of cutting, sawing, ligaturing, anastomosing or suturing, it is evident that in these various surgical processes there is a more or less pronounced tendency towards automatism.

“Manual work properly so-called is not called upon to disappear, as might be imagined from a too-superficial or hasty consideration of the subject; it will always have a basic and indisputable value, but it is called upon to be transformed. Surgery, having a tendency to be industrialized, by which I do not mean to indicate a change for the worse, will become a more and more complicated organization, in order to obtain more rapid and extensive results and to render the greatest possible service to the patient.”—*Dr. Dartigues.*



School Dentistry

This Department is Edited by

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We are anxious to receive for publication in this Department reports of work carried on in School Dental Centres anywhere in Canada. Papers on any phase of Pedodontia would also be welcome.—E.A.G.



Annual Report of Dental Service, Department of Public Health, Toronto

Medical Officer of Health.

Director of Dental Services.



HE following is a report of the work performed by the Dental Service of the Department of Public Health during the year 1926:—

Two appointments were made to the staff in 1926, which now consists of the Director, who is responsible to the Medical Officer of Health, and 32 dental officers, each of whom has a trained dental assistant. The service conducts 30 clinics in the schools, 25 in the public schools and 5 in the separate schools. Three dental officers devote their whole time to the dental survey and all school children are dentally examined each year.

A study of the statistics shows that as a result of the educational campaign conducted by the school medical officer, the dental officer and nurse, teaching that a clean mouth is one of the first essentials to good health, out of 74,238 children examined only 1,090 had septic mouths and 1,482 had unclean mouths, which together are only 3% of the total number examined. This is a great improvement over conditions existing before a dental service was inaugurated, when over 50% of children had seriously unhealthy mouths.

The percentage of children with defective teeth remains the

same as last year, viz., 66% or 49,369, but here again, an improvement over former conditions when 7 to 10 cavities per child was the rule, can be seen, as the average is now only 2 cavities per child. One fact to be regretted is the prevalence of irregular teeth, 10,185 out of the 74,238 examined, which is nearly 14%, were reported as having faulty occlusion. This is a problem to which some attention must be given. Orthodontic treatment, or the straightening of the teeth, owing to the special knowledge required and the length of time to accomplish correction, seems entirely outside the scope of a public service, but something could be done in the way of preventive orthodontia in the pre-school years, so that such serious conditions would not arise later on.

During the year, dental service was extended to the two new vocational schools. Equipments were installed and Dr. Russell Bennett was appointed to the Junior Vocational School for Boys, and Dr. Flora Cowan to the Edith L. Groves School for Girls. The principals of these schools consider the correction of dental defects a most important factor in their work for these backward children.

Also in 1926, the Department opened in co-operation with the Dental Faculty of Toronto University a Children's Clinic at the Dental College. The Dental Faculty maintains a clinic for the purpose, equipped with 10 chairs, and also places the facilities of special laboratories, the x-ray, the surgical, bacteriological and preventive dentistry departments, at the disposal of this clinic for the study and treatment of special cases. The clinic is in charge of a dental officer of the Department, and his assistant arranges appointments for school children through the Nursing Service and makes reports of all operations performed, to the Department. Each student is required to spend one month's service in this Children's Clinic, and thus acquires a useful knowledge of children's dentistry and Public Health service. In addition to taking care of all cases referred to them, the College also takes radiographs of any special cases from our own clinics. They also undertook orthodontic treatment, or the straightening of teeth for 60 cases of malocclusion, selected from the schools. A special study is also being made in their Research Laboratories of the problem of rapid decay of the teeth in young children, from which it is hoped some new light may be thrown on this condition.

ORAL HEALTH for September, 1927

ANNUAL SURVEY.

	1926.
No. of children examined	74,238
No. of children with defective teeth	49,369
Percentage of defects	66%
Class Room Talks	1,958
No. of Cavities in Deciduous Teeth	91,379
Average No. of Cavities in Deciduous Teeth per child	1.23
No. of Cavities in Permanent Teeth	69,285
Average No. of Cavities in Permanent Teeth per child	.93
Cases Requiring Orthodontic Treatment	10,185
Cases Requiring Prophylaxis	1,482
Percentage of Cases Requiring Prophylaxis	1.5
Cases of Oral Sepsis	1,090
Percentage of Cases of Oral Sepsis	1.2

SUMMARY OF WORK IN CLINICS.

Operative Clinics in Public Schools. (This also includes Clinics of one month each, conducted during the summer months at the Victoria Park and High Park Forest Schools).

	1926.
Extractions of Deciduous Teeth	14,486
Extractions of Permanent Teeth (6 year molars)	547
Local Anæsthetics	6,494
Amalgam Fillings	35,694
Cement Fillings	11,782
Prophylaxis Treatments	6,939
Temporary Fillings	3,864
Arsenic Devitalizations	408
Root Treatments	2,824
Root Fillings	480
Other Treatments (relieving pain, silver nitrate, opening abscess, etc.)	14,484
No. of Patients Treated	39,925
No. of Patients Completed	24,838

Four Extraction Centres in Public Schools.

Extractions of Deciduous Teeth	15,615
Extractions of Permanent Teeth	2,646
Local Anæsthetics	3,228
General Anæsthetics	3,121
No. of Patients Treated	6,570

Five Clinics in Separate Schools.

Extractions of Deciduous Teeth	4,802
Extractions of Permanent Teeth	552
Local Anæsthetics	1,860
Amalgam Fillings	6,284
Cement Fillings	2,454
Temporary Fillings	170
Prophylaxis Treatments	1,200
Arsenic Devitalizations	54
Root Treatments	146
Root Fillings	78
Other Treatments (relieving pain, silver nitrate, relieving abscess, etc.)	509
No. of Patients Treated	4,949
No. of Patients Completed	2,942

Grand Total of Work in Both Public and Separate Schools.

Extractions of Deciduous Teeth	34,903
Extractions of Permanent Teeth	3,745
Local Anæsthetics	11,582
General Anæsthetics	3,121
Amalgam Fillings	41,978
Cement Fillings	14,236

ORAL HEALTH for September, 1927

Temporary Fillings	4,034
Prophylaxis Treatments	8,139
Arsenic Devitalizations	462
Root Treatments	2,970
Root Fillings	558
Other Treatments	14,993
Total No. of Operations	140,721
Total No. of Patients Treated	51,444
Total No. of Patients Completed	27,780

Brief Summary.

No. of Children Examined	74,238
No. of Children with Defective Teeth	49,369
No. of Children Treated in School Clinics	51,444
No. of Children Completed in School Clinics	27,780
Total No. of Operations Performed	140,721

Cost of Service.

Salaries	\$55,423.94
Telephone, Postage, Laundry and other Services	1,020.61
Dental Supplies	5,284.65
Upkeep and Depreciation of Equipment	1,188.33
Total	\$62,917.53

The total cost of \$62,917.53 compared with the school population of 105,170, gives an average cost for the school dental service of 60 cents per child, or comparing this total cost with the work done, viz., 74,238 children examined and 140,721 operations performed, the average cost is 10 cents for the examination, and 39 cents for each operation.

Definition of "Dentist"

HE *Free Press Evening Bulletin*, of Winnipeg, has been conducting a series of prize contests for the best answers in definition of selected professions and other vocations. A few weeks ago, the word to be defined was "Dentist," the first prize being awarded to a Winnipeg gentleman who answered as follows: "Dentist—the only man who can silence a woman." Honourable mention was given to the following answers: "A strong, silent man who dotes on the wide open spaces." "The only person who feels no pain while getting teeth out." "A man who can support himself by the teeth."

W. W. W.

PUBLIC EDUCATION DENTAL HEALTH

"The public has decided it wants health talk and means to get it! The lay press is the most powerful medium of instruction for the public in health matters. We must do our best to secure its co-operation!"—Sir Thomas Horder.

IN this department each month will be published short articles suitable for use in the public press. The material has been authorized by the Oral Hygiene Committee of the Ontario Dental Association, and members of the profession may feel free to arrange for its publication in the local papers or magazines.

TOOTH CLEANSING FOODS.



THE most highly civilized peoples of to-day and, in particular, those living upon the North American continent, buy more tooth brushes and dentifrices, and pay more attention to mouth toilet than any other peoples of this or any previous age. But yet, among them, tooth decay is universal and rampant.

In contrast, it appears that primitive man suffered little, if at all, from decayed teeth.

Investigators, after having examined several hundred skulls of Indians from the South American continent, who lived between two and three hundred years ago, report that only a single tooth in the entire collection showed dental caries.

In proof that this is not merely a racial factor, they have found that where savage people and others have modified their diet in a manner similar to the European or American, there has resulted a rapid deterioration of the teeth, with tooth decay becoming very prevalent.

Now, undoubtedly, much of this deterioration of tooth structure has been due to a lack of inorganic salts, which are the essential "building stones" of tooth tissue. But, on the other hand, with the adoption of softer foods with their modern methods of preparation, much less masticatory effort is required on the part of the teeth, and they lose the beneficial effects of scouring and cleansing such as were secured when grains, roots, and raw fruits formed the chief articles of diet.

The habitual use of some of the harder foods, such as toast, crusts, shredded-wheat and nuts, along with certain of the raw and dried fruits and vegetables, would prove most beneficial as tooth cleansing foods apart from their nutrient values.

"An apple a day" might indeed keep the dentist away as well as the doctor.

We should avoid the excessive use of sweets and sweet foods, particularly of the pastry type, which adheres to the teeth.

* * *

TOOTH DECAY.



YOU do not allow your child too many sweets lest they spoil his teeth, and, wisely, you do not let him know their taste too early. But where's the harm?

Now, as you have read, no doubt, so called tooth decay is a disease that is incited by bacteria. These micro-organisms have the power of setting up fermentative processes in left-over carbohydrate matter in the mouth, producing acids which attack the tooth substance to dissolve it; in this manner, these organisms gain access through the hard enamel covering.

You perhaps did not suspect the presence of bacteria in your mouth, did you? Yet, a noted authority states that more than a hundred different species could undoubtedly be isolated from a single mouth at one time or another.

Now, of course, it is neither practicable nor possible to cut off the carbohydrate food supply, nor to rid the mouth of bacteria for any length of time.

However, Nature herself is not wholly defenceless against the situation, for the acid formed is, as a rule, taken up by the saliva and dissipated before it can do injury—excepting where it can lie undisturbed as in deep pits or fissures, or beneath food particles that adhere to the tooth when proper mouth toilet is not observed.

But you must do your part by avoiding excessive use of carbohydrate foods such as sugars, starches and allied substances, for the use of a too liberal supply of these is to create a condition than can but invite disaster—especially when proper mouth toilet is not the daily rule.

* * *

TOOTH EXERCISE.



YOU have read considerable of late about the "daily dozen," and other such setting-up exercises.

So you know, of course, that the body requires exercise if it is to develop and keep fit.

You have been told, too, that a vigorous chewing of your

food is both beneficial and necessary as the first step in good digestion.

But perhaps you have never given thought to the beneficial effects of thorough mastication on the tooth structures themselves.

In the first place, then, there is the stimulating effect on the supporting structures of the teeth, giving them proper "tissue tone."

In the growing child, the development of the jaws necessary to provide for the normal arrangement of the tooth, is impossible without sufficient masticatory exercise.

Former generations ate hard and coarse foods, and suffered little from dental trouble.

Mastication of such tough uncooked food gave to their teeth and jaws sufficient exercise to promote the most vigorous circulation and a very decided massage of the gums. These agencies through the abundant blood supply to the jaws provided ample tissue nourishment for growth and development, along with great powers of resistance to infection.

To-day, we are using a great many over-refined and pre-digested foods, which require little or no chewing, and in the use of which even the mechanical effects from the scrubbing of the tooth surfaces are lacking, with the result that Nature, working out her inexorable law that a member that is not functioning as intended gradually loses its efficiency, is making the tooth structure softer and less resistant to disease.

There should be, therefore, an habitual use at each meal, of foods selected, not only on account of their nutrient qualities, but because they are of such a nature as to require vigorous masticatory effort.

Be Prepared



HERE are practitioners who begin an extraction with a single pair of forceps; if they meet with difficulty, they take out of their cabinet the required instrument (assuming it is there and not among the instruments waiting to be cleaned) while the patient waits, breathless, anxious, for the operation to be resumed. You must always foresee the possibility of complications, and have within reach all the perfectly sterilized operating material which may be required during the course of the operation.—*E. Benoist, La Semaine Dentaire.*



British Columbia—W. J. BRUCE, D.D.S., 404 Birks Bldg., Vancouver.

Alberta—JOHN W. CLAY, D.D.S., 914 Herald Bldg., Calgary.

Saskatchewan — C. W. PARKER, D.D.S., Imperial Bank Bldg., Regina.

Manitoba—W. W. WRIGHT, D.D.S., 767 Warsaw Ave., Winnipeg.

Maritime Provinces—J. STANLEY BAGNALL, D.D.S., 34 Larch Street, Halifax, N.S.

Ontario—LIEUT.-COL. W. G. THOMPSON, 46 Sun Life Bldg., Hamilton.

STANLEY G. McCAUGHEY, D.D.S., 384 McLaren St., Ottawa.

Quebec—M. L. DONIGAN, D.D.S., 127 Stanley St., Montreal.

PAUL GEOFFRION, D.D.S., 308 Sherbrooke Street, Montreal.

Provincial Editors will appreciate receiving from all local societies copies of papers, society proceedings or personal notes, for publication.



MANITOBA.



HE golf tournaments played monthly among the Winnipeg dentists will enter the semi-final series on August 17th. The golf committee has been very energetic, as many as 90 players having been out in one afternoon. This speaks well for the good fellowship existing among the Winnipeg dentists, as well as for the managing committee.



Many Winnipeg dentists have been holidaying in various parts of Canada and the States, mostly by auto. Among those heard of are:— H. W. Mitchell, Howard Geddes, D. A. McCarten, A. E. Proctor, Charlie Walsh, C. M. Truman, L. E. Lovegren, Everett White, (to St. Mary's Old Boys' Reunion), N. C. Carmichael, Douglas Brown, F. E. Warriner, Bill Taylor, Clare McInnes, C. D. McLeod, Garnet Leckie and Bert Greenfield, who received a prize in a fishing contest for the largest pickerel.



Dr. Archie Graham, of Boissevain, is slowly recovering from the auto accident he had this spring, when the steering device of his new car locked on turning a corner, resulting in a crushed chest, several broken ribs and other injuries to Archie. Archie doesn't mind turning upside down in an airplane, but never again in a car. Dr. Livingstone is assisting him until he can resume his practice.

ALBERTA.



ALGARY and all Alberta is a long way from the dental centres of Canada and the United States. As a result it is difficult for the members of the profession to keep in touch with the developments which, in recent years, have followed one another with startling rapidity.

Largely due to this there evolved the idea of having clinicians come to our cities to give everyone the opportunity of keeping in touch with at least the major changes in thought and teaching. From the time when Dr. W. E. Cummer of the old R.C.D.S. visited us in 1918—a visit we still remember with pleasure and profit—till to-day, there has been a steady stream of new thoughts and ideas permeating the practices of the dentists of Alberta. Only a moment's thought is necessary to make one realize what a higher plane of professional knowledge has been attained as the result of the willing labours of the many able clinicians who have visited us.

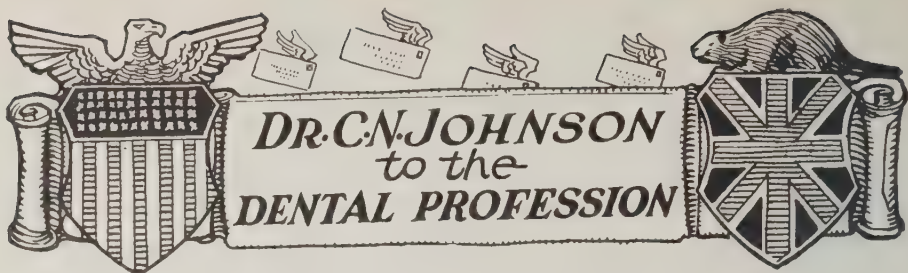
The fact that Calgary is on the most picturesque high road to California accounts for the fact that a Calgary Dental Society study group in prosthetic dentistry was recently enabled to hold a practical class with Dr. J. A. Bothwell, of the Faculty of Dentistry of the University of Toronto as clinician. Five sessions were held, and into them was packed a great amount of valuable instruction on full denture construction. The members of the class were unanimous in feeling that it was one of the best and most practical courses of instruction they had ever attended. Dr. C. B. Johnson expressed the appreciation of the group to Dr. Bothwell on his leaving for the coast.

* * *

Dr. J. McCaffery, U. of T., '27, has commenced practice in the Herald Building, Calgary. He has also received an appointment to the Dental Staff of the Public School Department of Health.

* * *

Dr. Leslie Allen, of Lethbridge, was recently in Calgary for Dr. Bothwell's clinic.



A Morning Walk



WAS in the country. It was Sunday—early. Out here it is “the Sabbath,” and it is different from Sunday in the city. I like it, but I have often wondered why one space of time is more sacred than another. To me all time is very, very sacred, and I am constantly appalled at the indifferent waste of it on the part of most people. No, this is not a dissertation on economy of time; it is merely to tell of an early morning walk in the country. And what can be more delightful than that ! !

Buddy, one of the Pomeranians, when he heard me stirring pounced into my room and enthusiastically exclaimed: “You’re the kind of a guy I like”—Bud uses slang sometimes—caught it from the humans—and he’s the type that picks up slang very readily. Bud is something more than a scamp—he’s a ragamuffin. Just this very minute he jumped up on my bed as I am writing, and when I reminded him that this was no place for a dog with dirty paws, the rascal argued with me. In the most ingratiating way he tried to lick my face, and pleaded that the bed was such a nice soft place for a little dog that was tired—and of course Bud is now lying peacefully on the bed pretending to be sound asleep. I have a soft place in my heart for dogs.

I never knew till now that there was so much character in a pomeranian. These two, Buddy and Tiny, are full of their ways, and their ways are very interesting. Bud is irrepressible. If he does something wrong, which is quite frequently, and you reprimand him, his ears drop instantly and he is a picture of the utmost dejection—for just one fleeting flash of time. The moment he sees an opening his tail wags furiously and he exclaims: “Oh, what’s the use in holding spite—it’s too fine a world for that,” and he is immediately as pert as ever. Tiny is more temperamental—as is her age-old prerogative. If she is scolded she takes on an air of injured innocence and slinks away in some corner to sulk. She doesn’t readily get over her miff, but is inclined to pout till someone comes along with a

caress to soothe her feelings. Typical? I merely ask the question.

This morning Bud and I had a wonderful walk. First it is down grade for a while till you come to the river, and then as you cross the bridge you begin a steady climb up a winding road to the top of the hill. It is the government highway, and as you reach the crest—a bit out of breath—you get a glimpse of the long white roadway ahead, smooth as if sandpapered, and raised a trifle in the centre for drainage. It is a beautiful road, a heritage of the automobile, but for which the roads of America would doubtless be a mess. Hats off to the automobile.

I walk along with a good swinging stride, having achieved my second wind, kicking now and then a large stone to the side of the road to prevent a tire from hitting it and getting a bunion. Few cars are out this morning, and these are through tourists driving like mad as if they were trying to reach the end of the world before night. The farmer folks are not up yet—it being Sunday and their day for sleeping in, bless their hearts.

A flock of crows are holding a caucus in the top of a half-grown pine, and it sounds as if something serious is going on. They are evidently trying one of their number for some misdemeanor, and it looks as if it might go hard with him. It is with crows as with humans; when the crowd gets down on an individual every one seems to love to give him a kick. Evidently this morning there is not one kind or encouraging word for the culprit.

Bud is tempestuously barking his head off over in the woods, probably tackling something ten times his size, as is his custom. I call him in vain. After walking on a quarter of a mile and almost giving him up, I finally see him tearing after me at break-neck speed like a ball of black fur bounding through space. I chide him for running off like that, but it does no good—Bud, as I have said, is irrepressible, like some folks. He is darting here and there chasing a squirrel along the fence or barking vociferously at the birds.

I stop by the roadside to pick some autumn leaves to mail to my friends in the city and Bud misses me. Soon he comes bounding back to see what I am doing. "Autumn leaves, hey?" he sniffs in sour disdain. "The idea of fooling away time on autumn leaves when there are perfectly good squirrels and birds to chase." Plainly he is disgusted. A little further

I stop under another maple. This time Bud makes no attempt to disguise his contempt. "Well—if I didn't think an awful lot of you, I'd have nothing more to do with you. Maple leaves—bah!" I fear it is the same with some people; and it may be fortunate that we have different tastes; it adds to the zest of life.

I get a great thrill out of this early morning walk. I really ask forgiveness for the thoughts I have of a big city on a morning like this in the country—they are so far from flattering. I can actually feel the quiet entering my soul—it touches me as something tangible. It purifies me, and I hope it makes of me a better man. I have walked only a few miles (Bud has covered leagues and leagues), and yet I experience a regeneration. I am in a mellower mood toward the whole world, and all the meanness, and hatred, and strife, and narrowness seem so far away.

If you want to be refreshed in body and mind, if you want to hear the greatest sermon ever preached, take a walk in the country in the early morning and listen to the myriad-toned voice of nature. If you are not sanctified by this, you are beyond hope.

C. H. Johnson

Need for Dental Health Education



THE following reasons were given by parents for refusing dental treatment for their children in School Dental Clinics in England:

"Bad teeth run in the family."

"He won't go and I can't make him."

"What was our teeth given us but to eat with, and you wants to draw them."

"I'll take her to a proper dentist when her teeth ache."

"The same Power that placed them there will make due change when necessary."

"Is the child mine or the L.C.C.'s?"

"His father has had toothache all his life, so the child will have to put up with it."

Oral Health

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EDITORIAL

Congratulations, Doctor McElhinney



THE Editor has greatly enjoyed reading Doctor McElhinney's little book of poems, "Morning in the Marsh," and offers sincere congratulations to the author, with the hope that every member of the dental profession will secure a copy.

Just as we go to press we received from Doctor W. W. Wright, of Winnipeg, a letter of commendation from which we quote the following words:

"Have you read the only book of poems published by a Canadian dentist? I received my copy of 'Morning in the Marsh' and have already read it twice, and some poems several times. I'm jealous of the author! Like most school boys, I tried my hand at rhymes and eventually rose to the pinnacle (?) of class poet of our graduating class in dental college. There being nothing greater than that in poetry, I ceased, and settled down to the prose of earning a living. But if you have not secured your copy of 'Morning in the Marsh,' call your

dealer at once and secure it. You'll have another reason to be proud of your profession, and its poet laureate.

"I am particularly in love with 'Morning in the Marsh,' 'The Sunset on the Rideau,' 'The Song,' and 'This Evil World.' The writer shows great ability to paint pictures and express his philosophy in verse. It is easily seen that he is a keen observer as well as a great admirer of the wonders of nature. He and the owner of E. P. Ranch can spend a morning in the marsh any day this Fall with me. Dr. McElhinney, of Ottawa, let me openly congratulate you on your splendid contribution to Canadian literature!"

* * *

Dominion Dental Council Examination Results

THE following have passed their Dominion Dental Council examination, June, 1927, in the following subjects:—

Pathology and Bacteriology—Anderson, P. G.; Boykowich, M. H.; Burskin, J. A.; Carman, H. A.; Carroll, J.; Dobson, J. W.; Greenberg, N. H.; Hare, G. C.; Husband, C. D.; Little, R. V.; Lloyd, V. M.; Moffatt, H. F.; McCaffery, J. M.; Rabinovitch, A.; Rodger, C. T.; Singer; Skinner, C. L.; Tilson, J. E.; Toll, C. E.

Pathology (only)—Demuth, A. H.; Irwin, A. W.; Johnson, B.

Bacteriology (only)—Carmichael, L. D.; Davies, O. J.; Dempster, J. C.; Lowry, C. M.; Layter, G. C.; Revell, A. M.; Robb, H. M.; Siebert, W. J.; Simpson, C. S.; Wasson, K. C.

Orthodontia, Jurisprudence and Ethics—Adam, S. R.; Burskin, J. A.; Carman, H. A.; Carroll, J.; Demuth, A. L.; Dobson, J. W.; Eaton, H. M.; Greenberg, N. H.; Haverstock, A. B.; Holt, S. W.; Israel, L. G.; Johnson, B.; Lloyd, V. M.; McCaffery, J. M.; Polack, I. G. G.; Rabinovitch, A.; Rodger, C. T.; Singer, A.; Squire, G. C.; Tilson, J. E.; Toll, C. E.

Orthodontia (only)—Carmichael, L. D.; Davies, O. J.; Hare, G. C.; Layter, G. C.; Moffatt, H. F.; Dempster, J. C.

Jurisprudence and Ethics (only)—Lesco, S. J.

Anæsthetics—Adam, S. R.; Anderson, P. G.; Burskin, J. A.; Carman, H. A.; Carmichael, L. D.; Carroll, J.; Davies, O. J.; Dempster, J. C.; Demuth, A. H.; Dobson, J. W.; Eaton, H. M.; Greenberg, N. H.; Hare, G. C.; Haverstock, A. B.; Husband, C. D.; Irwin, A. W.; Israel, L. G.; Johnson, B.; Layter, G. C.; Lloyd, V. M.; Moffatt, H. F.; McCaffery, J. M.; MacDonald, J. A.; Rabinovitch, A.; Robb, H. M.; Rodger, C. T.; Singer, A.; Tilson, J. E.; Toll, C. E.

Materia Medica and Therapeutics—Aunger, Wm. R.; Burskin, J. A.; Claman, B.; Davis, Lloyd; Demuth, A. H.; Dobson, J. W.; Galshy, H. A.; Gruer, W. P.; Hall, F. M.; Johnson, B.; Kingman, G.; Layter, G. C.; Lloyd, V. M.; Morrow, A. B.; McCaffery, J. M.; Portigal, S. L.; Priest, M. S.; Rodger, C. T.; Skinner, C. L.; Somerville, A. A.; Whitman, O. B.

Materia Medica (only)—Buchanam, G. A.; Wetmore, S. K.

Anatomy—Anderson, P. G.; Bernstein, A. H.; Brown, J. F.; Burskin, J. A.; Coupland, J. P.; Craig, M. L.; Culbert, M. R.; Dunn, A. S.; Fraser, W. S.; Greenberg, I.; Hall, F. M.; Halldorson, O. G.; Harris, F. E.; Johnson, B.; Little, R. V.; Lloyd, V. M.; Lowry, C. M.; Merrell, J. H.; Patterson, C. J.; Revell, A. M.; Robertson, C.

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S.; Rodger, C. T.; Shapera, E.; Siebert, W. J.; Simpson, C. S.; Skinner, C. L.; Maclinou, M.; Wasson, K. C.

Physiology and Histology—Anderson, P. G.; Hall, F. M.; Lowry, C. M.; Revell, A. M.; Rodger, C. T.; Siebert, W. J.; Simpson, C. S.; Wasson, K. C.

Physiology (only)—Aunger, W. R.; Burskin, J. A.; Carroll, J.; Claman, B.; Demuth, A. H.; Greenberg, I.; Gruer, W. P.; Layter, G. C.; McCaffery, J. M.; Portigal, S. L.; Skinner, C. L.; Somerville, A. A.; Wetmore, S. K.; Whittaker, G. W.; Whitman, O. B.

Histology (only)—Bernstein, A. H.; Brown, J. F.; Buchanan, G. A.; Coupland, J. P.; Culbert, M. R.; Dunn, A. S.; Fraser, W. G.; Harris, F. E.; Levinson, K. I.; Patterson, C. J.; Robertson, C. S.; Shapera, E.; Maclinou, M.

Operative and Preventive Dentistry—Adam, S. R.; Anderson, P. G.; Burskin, J. A.; Carroll, J.; Demuth, A. H.; Dobson, J. W.; Eaton, H. M.; Haverstock, A. B.; Holt, S. W.; Israel, L. G.; Johnson, B.; Lloyd, V. M.; McCaffery, J. M.; MacDonald, J. A.; Polack, I. G. G.; Rabinovitch, A.; Rodger, C. T.; Singer, A.; Squire, G. C.; Stitt, M. L.; Sutherland, G. D.; Toll, C. E.

Prosthetic Dentistry—Adam, S. R.; Anderson, P. G.; Burskin, J. A.; Carroll, J.; Demuth, A. H.; Dobson, J. W.; Eaton, H. M.; Haverstock, A. B.; Holt, S. W.; Israel, L. G.; Johnson, B.; Lloyd, V. M.; McCaffery, J. M.; MacDonald, J. A.; Polack, I. G. G.; Rabinovitch, A.; Rodger, C. T.; Squire, G. C.; Singer, A.; Stitt, M. L.; Sutherland, G. D.; Toll, C. E.

Medicine, Surgery and Radiology—Adam, S. R.; Boykowich, M. H.; Burskin, J. A.; Carroll, J.; Demuth, A. H.; Dobson, J. W.; Eaton, H. M.; Haverstock, A. B.; Holt, S. W.; Irwin, A. W.; Israel, L. G.; Johnson, B.; Lloyd, V. M.; Montgomery, A. R.; McCaffery, J. M.; Polack, I. G. G.; Rabinovitch, A.; Rodger, C. T.; Singer, A.; Squire, G. C.; Toll, C. E.

Physics, Chemistry and Metallurgy—Adam, S. R.; Burskin, J. A.; Buchanan, G. A.; Claman, Ben; Davis, L.; Demuth, A. H.; Galshy, H. A.; Gruer, W. P.; Hall, F. M.; Harrington, R.; Johnson, B.; Kingman, G.; Layter, G. C.; Little, R. V.; Lowry, C. M.; Morrow, A. B.; McCaffery, J. M.; Portigal, S. L.; Priest, M. L.; Revell, A. M.; Rodger, C. T.; Siebert, W. J.; Simpson, C. S.; Skinner, C. L.; Somerville, A. A.; Wasson, K. C.; Wetmore, S. K.; Whittaker, G. W.; Whitman, O. B.

Metallurgy (only)—Dobson, J. W.; Eaton, H. M.; Haverstock, A. B.; Israel, I. G.; Moffatt, H. F.

Chemistry and Metallurgy—Lloyd, V. M.

* * *

Personal Sketch of Subject of this Month's Frontispiece

DOCTOR George L. Cameron was elected President of the Dental Society of Western Canada at the recent Convention in the City of Edmonton, he having served during the past year as Vice-President of the Society. He has been a dental practitioner in Swift Current, Sask., for many years, and a valuable member of the Board of the Saskatchewan College of Dental Surgeons, of which he was President from 1923-1926.

Dr. Cameron graduated from McGill in 1908. He went overseas with the Canadian Cavalry, being later transferred to the 1st Canadian Infantry, of which battalion he became second in command. He served in the active forces during the

war from 1915-1918, and was honoured in being awarded the Distinguished Service Order. Upon being wounded he was transferred to the Canadian Army Dental Corps, of which he was A.D.D.S., M.D. Nos. 12 and 13, during the years 1919 and 1920.

Dr. Cameron has taken a keen interest in the public affairs of his community, having been a member of the local School Board, President of the Swift Current Hospital, and an alderman of the City. He is also a past President of the Rotary Club, and a past Grand Master of the Saskatchewan I.O.O.F. Dr. Cameron is married and has four children.

* * *

Detroit For You

DR. PAT J. O'REILLY, PRESIDENT DETROIT DENTAL SOCIETY.



THE Detroit Dental Society feels greatly honoured to extend to organized dentistry of Canada greetings and an earnest and hearty welcome to our great city this October. The American Dental Association will then hold what will prove to be her greatest meeting ever. Men everywhere will arrange their affairs to attend this great gathering. Reservations are being made daily. More than ten thousand will be here. We can accommodate twice that number.

The sessions will be held under one roof, the General Motors Building, in every way excelling every other building of its kind on earth. Our "Committee to make you comfortable" will number one thousand. Your every want will be anticipated. You shall be able to see the latest, finest, and best in dental equipment; to confer with the foremost minds in the dental world in the specialty of your choice; to catch the inspiration which must come from seeing the hosts of your dental confreres, all here for the purpose of equipping themselves for better service to their patients. Your old friends will be here and you will make many new ones. Who can afford to miss so great an opportunity, so great a meeting?

Then, too, your social pleasure will be assured. Dinners and balls, sight seeing and inspection of plants which attract thousands from the world's remotest corners. These and many other features will contribute to make your visit pleasant.

We welcome you.

We behold all round about us one vast union in which no man can labour for himself without labouring at the same time for others.—*Hyperion*.



W. J. LEA, D.D.S., VANCOUVER, B.C.,
Registrar, College of Dental Surgeons of British Columbia.

ORAL HEALTH

*A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION AS WELL AS THE POUND OF CURE*



Vol. 17

TORONTO, OCTOBER, 1927

No. 10

Proceedings of the Canadian Dental Association Meeting, 1927

President's Address

JOHN W. CLAY, D.D.S., CALGARY.



THE honor and pleasure has been given me of presiding at this meeting of the Canadian Dental Association and speaking officially for it on this occasion. It is fitting that my first words should be ones of welcome to the members who have come from all the Provinces of our Dominion from the Atlantic to the Pacific. On behalf of the Officers and Executive, I welcome you to the present sessions of the Canadian Dental Association.

We confidently hope that this meeting will enlarge the fraternal feeling of the members of the Association, and that we will return to our homes inspired with a higher professional spirit as well as with a wider knowledge of the science and practice of Dentistry.

Last year your Association met in Halifax as the guests of the dental fraternity of that City. Those of us who attended the meeting were delighted with the beautiful surroundings, the quality of the programme provided, and the kindness and courtesy with which we were entertained. Through the modesty of Dr. George Kerr Thomson, the President, who was one of those who laboured for our benefit at that time, no recognition in the President's address was made of this fact. In addition to the vote of thanks passed at the time, I should like to record publicly our appreciation of the unselfish work of the Halifax Dental Society on that occasion.

This year we meet here in the City of Toronto as the guests

of the Ontario Dental Society. Sixty years ago the agreement of Upper and Lower Canada marked the commencement of that process of union which later resulted in the formation of the Dominion of Canada. On this occasion we celebrate the 60th Anniversary of the Ontario Dental Society--the same age as our Dominion--which has grown in these years from a feeble beginning to a well-organized society of large proportions. This present meeting is a splendid material expression of the ability and professional spirit of the Dental Profession of Ontario.

The Canadian Dental Association is under a debt of gratitude to the Ontario Society for its kind hospitality, which makes possible the meeting in Toronto of our Association. The Officers and Members appreciate the opportunity afforded them of being present at the celebration of the 60th Anniversary of the Ontario Dental Society and extend their best wishes for the future.

Last year in Philadelphia many of us were fortunate in being present at the meeting of the Seventh International Dental Congress. It was a significant occasion for the dental profession of the United States of America. The Tercentenary of a great Republic was being celebrated at the place of its birth, and it was fitting that the American Dental Association should at that time and at that place act as host to the Dental Profession of the countries of the world. The kindly hospitality and untiring efforts for the advancement of professional knowledge on the part of our hosts spread abroad a great wave of friendship and inspiration which reached to the far corners of the globe.

We, the members of the Canadian Dental Association, owe much to our confreres to the South of us. Whether we go to visit them or whether we ask them to come over and help us, the response is the same. We are largely indebted to them for the generous fraternal spirit which prompts them to give freely of time and energy so that the knowledge they have acquired and the experience which they have gained may be of equal benefit to us as to themselves.

I would like, however, to turn your attention for a few moments to the Canadian Dental Association. It is my purpose to confine most of my remarks to a frank recognition of the shortcomings of the Canadian Dental Association, to a resumé of what appear to me to be the underlying causes of our

deficiency, and to as strong a plea as I can offer for the united effort of all the members of our Profession to keep alive and develop an all-Canadian spirit in Dentistry.

In the midst of the numerous anniversaries and birthdays which we are being given notice of from all sides, it is interesting to recognize that this is also a time of anniversary for the Canadian Dental Association. It is now just a quarter of a century since the first meeting was held in the City of Montreal. As with Confederation, so with our Association; the leading part in the initial efforts was taken by the men of Upper and Lower Canada, with strong support from the leaders of thought in the Maritimes. Men of vision and energy were responsible for its inception, and we should not fail to appreciate their efforts. Our Association has functioned under great natural difficulties and there have been many and sufficient reasons why it has not developed during these years into the force in Canadian Dentistry which the hopes of its founders led them to expect.

With all its deficiencies admitted, let me point out that the Association has justified its existence. There has been patient effort on the part of such men as Willmot, Dubeau, Webster, Stevenson, Woodbury, Nolin, Cowan, Seccombe, Bradley, Magee, and to them we are indebted. Their work has borne fruit. The Dominion Dental Council, while not complete, is largely the result of the co-operative effort of these men, and other definite results could be recorded. The principal values, however, are the more intangible but important effects of association and co-operation.

In spite, however, of all that was done, the Canadian Dental Association finds itself to-day in a position of not having achieved the place in the life of Canadian dentistry which its founders had hoped for, and which I believe from the bottom of my heart it can and should achieve. I am convinced that there is a need in Canada for the Canadian Dental Association, and that it will continue to live and prove its worth, but it will only be by the desire and interest and by the united effort of the dentists of all the Provinces of the Dominion.

The problem of the survival and growth of the Canadian Dental Association is bound up closely with the problem of national solidarity and inter-provincial relations as apart from governmental union. It is fitting that in the year of the celebration of the sixtieth anniversary of Confederation, and in the

twenty-fifth year of its existence, we should make the effort to reorganize the Canadian Dental Association. It is well that we should attempt to establish it on a basis which will appeal to and interest the whole Dental Profession of Canada, and which will afford opportunity for growth, as Canada grows, into a useful and indispensable power for the good of Canadian dentistry.

To-day we are faced with the tendency towards a growing provincialism in Dentistry. The Prairie Provinces as a group are becoming less interested in relations with the Provinces of Ontario and Quebec. Their interests and relations are growing towards the Northwestern and Pacific Coast States. At present these provincial associations, representing some six or seven hundred dentists, are a small factor, but the time is not far distant when a considerable portion of the dental population of Canada will be in this division.

British Columbia, by force of its position, is closely united with Oregon and Washington. Ontario is a self-contained unit sufficient unto itself, and Quebec very much in the same position, while the Maritimes are isolated by distance and lack of a common meeting ground from the rest of us. This is the situation which has caused it to be considered of late whether it would be better to dissolve the Canadian Dental Association into several smaller more local groups.

It is true that we have the Canadian Dental Association operating in seven of the Provinces and keeping contact between them. By some it is felt that two Dominion organizations are unnecessary, and that the provincial representatives on that body might well conduct the affairs now divided between the two. It should be borne in mind that membership in the Dominion Dental Council obligates an interchange of license, which is not acceptable to all the Provinces, and that the rapidly changing and varying standards of qualification make for its instability. There are, too, problems and readjustments for the Dominion Dental Council to make within the next few years, which will be a testing time for it, and to which a good deal of thought and publicity should be given. These changing and different standards of preliminary and dental requirements in the Provinces affected will bring the whole matter to a focus. What will be the future of the Council, and if it will have a future, will depend entirely on the willingness of the Provinces to co-operate, and, to my mind, on a unification in the Prov-

inces of the Dominion of standards of entrance to the practice of Dentistry.

The Province of Ontario is now passing to a two-four standard requiring the same time of study as in the Province of Quebec. Dalhousie University also is at present considering the addition of a year to its course, while the other Provinces are still accepting for practice graduates who have had shorter periods of training.

What will be the status of the Dominion Dental Council certificate holder from a five-year Province, when he applies for license in a six-year Province, will be problematical. This matter must be given thought in the near future. It seems now the suitable time to consider the possibility of a unification of standards. It is not reasonable that only four years are necessary to make a dentist competent to serve a patient well in one Province, when six years are necessary to protect that patient when he moves across the provincial boundary.

A hopeful feature of the situation is the appointment by the Board of Governors of the Dental Association of the Province of Quebec of a committee of five to consider the question of inter-provincial relationships and interchange of license. This, I believe, is the result of an appreciation of the need of, and a desire for, closer relationship. It is an evidence of the viewing of the problems of Dentistry from the wider Canadian viewpoint. That other provincial bodies should recognize this need is a desirable thing.

Whatever the future of the Dominion Dental Council may be, there is need for provincial co-operation in a Dominion organization. This, without making it necessary for the represented Provinces to agree to interchange of licenses, will allow them to come together to discuss and act on matters which affect the whole Dental Profession of Canada. It will form a body which will be competent to deal with federal health matters, act for the Dominion in the matter of international relationships, and disseminate friendliness and unity between the sections of the Profession in the various parts of the Dominion of Canada.

The great and pressing need of concerted effort in the cause of public dental health and preventive measures, is apparent to all of us. This work is well organized in Ontario, and, notably in Nova Scotia and Saskatchewan, efforts are being made to

meet the problem. There is a great need of interesting the federal government in the possibilities of such activity.

It is claimed that some 60,000 (nearly 10%) of the population of Alberta alone are Ukrainian,—peoples of the Middle States of Europe. As this number grows, in the Western Provinces, subject to our types of food and ways of living, should we not give thought to the need of dental education and dental care of these and other settlers? Is it not reasonable that when they are admitted under careful medical scrutiny, they should also be met by federal dental officers to see that they at least start out with dental health? These are not provincial but federal problems, and the advancement of such projects is one of the justifications of the existence of the Canadian Dental Association.

Last week, as you know, delegates met to prepare for the consideration of the Provinces which they represent, a workable plan of reorganization. A resume of what is being done will be presented to you by Dr. Frank Harwood, of Saskatchewan, and your close attention and interest are asked for.

The support of the Canadian Dental Association by the *Revue Dentaire Canadienne* of Montreal, and *Oral Health* and the *Dominion Dental Journal* of Toronto, should be recorded. The editors of these journals have thrown the weight of their influence behind the Canadian Dental Association and have given liberally of their own time and space in their journals for the advancement of the Association. This report of the year's activity would not be complete without mention of the efficient and untiring services of our General Secretary, Dr. Stanley Bagnall.

There stands in Dominion Square in the City of Montreal a large and impressive monument. It was raised to commemorate Confederation. On one of its sides stands out the name of Etienne Cartier, on the other D'Arcy Magee, and at the front that of John A. Macdonald. That monument expresses a hope that should be in us all, the hope that from our various races and sections may develop a Canadian nationalism.

In closing, I beg you to go home as missionaries to your respective provincial associations, and there preach the gospel of the Canadian Dental Association. I ask you to look on this Association not only as a necessary dental organization, but as one of the links between the different parts of the Dominion,—links which give the breath of life to the form of

Confederation. Without these personal relationships, our Dominion Union is nothing but a tie which holds us in an uneasy marriage relation. Let us do our part as dentists for the true union of the Provinces and for the advancement of the Dental Profession of Canada.

* * *

Minutes of Meetings

J. STANLEY BAGNALL, D.D.S., *Secretary-Treasurer.*

MINUTES of Meeting of the Canadian Dental Association held at the King Edward Hotel, Toronto, on Tuesday, May 17th, at 2.30 p.m., are as follows:

The President, Dr. J. W. Clay, of Calgary, acted as Chairman. The President stated in his opening remarks that as there was considerable business before the meeting and only a limited time, it had been thought advisable that all unnecessary reports would be eliminated. He stated also that there would not be the usual messages of welcome and response to the Canadian Dental Association as this had already been so well done at the annual meeting of the Ontario Dental Association on the previous day.

Dr. W. W. Wright, Winnipeg, stated that he would like to move a resolution in appreciation of the wonderful way in which the delegates of the various provinces had been entertained since coming to Toronto by the Ontario Dental Society. Motion carried.

Dr. D. J. Berwick of Montreal, moved a resolution in appreciation of the hospitality received by the Canadian Dental Association from the Ontario Dental Association. The appreciation was signified in the usual manner. The President suggested that the Secretary send Dr. J. A. Bothwell, President of the Ontario Dental Society an expression of appreciation of the hospitality received, and remarked to Dr. Bothwell that while it was to be sent, they were glad that he was present to receive it at first hand.

The Minutes of the previous meeting were read by the Secretary. Dr. A. E. Webster, Toronto, suggested that all the committee members appointed at the meetings of the Association should receive instruction as to their duties. He moved that the Minutes of the previous meeting held in Halifax as read be approved. Seconded, Dr. J. A. Fleming, Prescott.—Carried. Dr. A. W. Winnett, of Kingston, stated that he had a resolution which had been brought forward by a number of members from the West after consultation with a number of members from the East.

“WHEREAS, during recent years science has clearly demonstrated that the prevention of diseases and the maintenance of good health must include proper care of the teeth and surrounding tissues, and whereas, during the

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great war the Canadian Army Dental Corps so ably demonstrated its ability to care for troops of His Majesty's forces, and whereas, the permanent forces should be rendered the best dental services possible, and whereas, at the present time there are no dentists appointed to the permanent forces of Canada,

"Be it resolved, that we, the Canadian Dental Association and Ontario Dental Association here assembled in joint Convention recommend to the Minister of National Defence the appointment to the permanent force of at least one dental officer to each military district and that a copy of this resolution be forwarded to the Minister of National Defence."

Dr. Winnett, in explanation of his resolution, stated that he had been connected with the Canadian Army Dental Corps throughout the war and spoke of its work and need, also that at the close of the great war, Great Britain had organized a Royal Army Dental Corps as a permanent unit. Adoption of the resolution moved by Dr. A. W. Winnett, seconded by Dr. H. C. Hodgson, Winnipeg. Dr. A. E. Webster, of Toronto, asked for an explanation as to the present necessity for the resolution. Dr. Winnett outlined the present method of treatment and the necessity for change. The President explained that the resolutions passed at the general meetings were acted on by the Executive who endeavoured to carry out the wishes of the resolutions. Dr. Winnett stated that he felt that if the Association could see their way clear to pass the resolution and appoint two or three members from this Association to go to Ottawa and interview the Minister of Defence it would have the desired effect. He suggested that perhaps Dr. Conboy could give some information as to what action had been taken by the Ontario Dental Association. Dr. Conboy, Secretary of the Ontario Dental Association, stated that this matter had been taken up by the Board of Governors of the Ontario Dental Association and that they had been in touch with the other provinces and the Minister of Defence at Ottawa. He felt sure that if the resolution were passed they could arrange for a very strong deputation to go to Ottawa and present the matter to the proper Minister there. The question was asked the chair, if there was not a committee on C.A.D.C. establishment. The President replied that there was not at the present time. The Chairman suggested that the above motion by Dr. Winnett and seconded by Dr. Hodgson be voted on and that if passed the Executive could deal with it then. Motion carried. Dr. Conboy remarked that this could be carried into effect with less expense if it were left with some Executive to arrange it. Moved by Dr. A. E. Webster, that the Chairman be given power to make such appointments as were necessary to deal with the resolution and with power to act. Seconded by Dr. W. E. Wilmott, Toronto. Motion carried.

Growing out of this discussion it was suggested that a similar resolution might be passed in relation to a civil

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dental organization, entailing services to the Department of Soldiers' Civil Re-establishment, the Schools for Indian Children, Public Institutions, etc. It was suggested by Dr. Wallace Seccombe that a similar resolution be passed and forwarded to the Department of Health, that there might be established in that department a dental service to look after the health question from the standpoint of dentistry. The Chairman asked that this motion be left over until the following day.

Dr. W. W. Wright asked that these matters be not published in the press at present. This question was left with the Executive to deal with. The President then called for nominations of ten members for the Executive Council. The following were nominated:

Dr. A. D. A. Mason, Toronto.
Dr. W. W. Wright, Winnipeg.
Dr. Frank C. Harwood, Moose Jaw.
Dr. E. L. Charron, Montreal.
Dr. D. P. Mowry, Montreal.
Dr. Archie Johnson, Vancouver.
Dr. W. P. Broderick, Saint John.
Dr. M. J. Gibson, Lethbridge.
Dr. H. C. Hodgson, Winnipeg.
Dr. W. R. Somerville, Haileybury, Ontario.

Moved by Dr. Wallace Seccombe that nominations cease. Seconded, Dr. E. A. Grant. Motion carried.

The President then asked Dr. F. J. Conboy, First Vice-President of the Association, to preside. Dr. F. J. Conboy then called on Dr. J. W. Clay, of Calgary, President of the Association, who gave his presidential address. Moved by Dr. Frank C. Harwood, Moose Jaw, that the President's address be incorporated in the Minutes and referred to the proper committee. Seconded by Dr. M. J. Nolin, Montreal. Motion carried.

Dr. F. J. Conboy relinquished the chair to Dr. John W. Clay.

Dr. Frank C. Harwood presented the following report on the meeting of the delegates in connection with the proposed changes in the Constitution of the Canadian Dental Association; "In accordance with a resolution passed at the meeting of your Association in Halifax, last year, the President called a meeting of representatives of each province of Canada, to consider reorganization of the Association. It was felt that as at present constituted, it did not fittingly represent the Profession of Dentistry in Canada and could not adequately speak for the whole profession in any large or national way. Only those who actually attended its meetings could be members of the Association and there was no provision for carrying on the business of the Association between meetings. Accordingly, accredited representatives from most of the Provinces met in this City and in this building on Saturday last, the 14th of May, and have continued to meet on one or two occasions since, to draft a proposed constitution and by-laws to be submitted

to the various provinces and to this Association. The proposed constitution with proposed by-laws is about complete and we believe it embodies the best features of a number of similar organizations. The present constitution of the Canadian Dental Association, the Constitution of the Canadian Medical Association, together with that of the American Dental Association, were used as the principal basis of our consideration. The principle on which we have worked is that of having the voluntary groups or Societies as units (whether Inter-Provincial, Provincial or local), which, together with ethical men in territory where there are no voluntary organizations, and who are taken care of in a special way, bound together by means of the Canadian Dental Association into one great body that will really represent Canadian Dentistry.

"Without attempting to go into the proposed constitution at this time, in view of the brief period allowed me for this report, I may say that it is proposed to create a Board of Delegates composed of the officers and delegates appointed by the Provinces. This Board of Delegates would act for the Association between meetings and would, in fact, transact most of the detail business of the larger body. This delegating much of the business of the Association to a smaller but representative group has worked very successfully in a number of similar organizations and is the method we propose to recommend to the Association and its constituent groups.

"The Membership fee has been placed very low in the hope that a very large and permanent membership will result, and the additional hope that the smaller constituent societies will collect the Canadian Dental Association fee from their members and forward to the Treasurer of the Association for the group. In that way a great many could be interested and the funds be collected with the minimum of expense and effort.

"It is also proposed that if in the territory where the C.D.A. decides to meet there is a provincial or smaller voluntary society, the Association will meet in conjunction with that society and perhaps be a means of stimulating the local society to greater effort on behalf of its members and the public at large.

"The complete draft of the proposed constitution and by-laws will come before each provincial or smaller society in due course for their consideration and constructive criticism, and will probably be submitted to this body at its next meeting. In the meantime I have endeavoured to give a brief outline of what the delegates have tried to do and trust that ultimately their efforts may in a humble way assist the Association to accomplish greater things for the profession to which we are proud to belong."

Moved by Dr. Wallace Seccombe, that the general meeting of the Canadian Dental Association learns with gratification of the progress being made by the appointed delegates

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of the provinces of Canada in the proposed re-organization of the Canadian Dental Association and the drafting of a new constitution to put into effect the principles adopted at the last meeting of the Association held at Halifax in 1926. Seconded, Dr. D. P. Mowry. Motion carried.

The Chairman reported that he had received from Dr. George Kerr Thomson, President of the Dominion Dental Council, a report on the activities of the Council. Dr. J. Stanley Bagnall, Secretary of the Canadian Dental Association read the report. The question as to whether this report should be embodied in the minutes was discussed. Dr. A. E. Webster stated that the original intention of the Canadian Dental Association was that the report from the Dominion Dental Council was read for information only and placed in the file of the Canadian Dental Association.

Moved by Dr. E. L. Charron, that the report of the President of the Dominion Dental Council be placed on file. Seconded, Dr. M. J. Nolin. Motion carried.

The Chairman announced that the final meeting of the Canadian Dental Association would be held at 4.15 on the following afternoon. Motion to adjourn by Dr. H. C. Hodgson. Seconded, Dr. M. J. Gibson. Carried. Meeting adjourned.

Minutes of the Meeting of the Executive Council, held at the King Edward Hotel, Toronto, at 2.20 p.m. on May 19th are as follows:

Present—Drs. D. P. Mowry, W. R. Somerville, John W. Clay, J. A. Bothwell, W. W. Wright, F. C. Harwood, Archie Johnson, Wallace Seccombe and J. Stanley Bagnall.

Dr. Johnson moved the adoption of the minutes of the previous meeting. Seconded, Dr. Mowry. Carried.

The Secretary presented a report of the finances of the Association which showed a balance on hand of \$824.78. Dr. D. P. Mowry moved that the report be adopted. Seconded by Dr. W. W. Wright. Carried.

Dr. D. P. Mowry moved that Dr. Wallace Seccombe and Dr. Archie Johnson be asked to prepare a resolution on dental services for institutions and individuals, for presentation at the next general meeting. Motion carried.

Dr. Archie Johnson explained his views with regard to the publication of special resolutions in the press so as to insure that this material be inserted accurately by the newspapers.

Dr. Archie Johnson moved that in view of the projected changes in the constitution of the Canadian Dental Association, the present Hon. President, President, 1st and 2nd Vice-Presidents be re-appointed. Seconded by Dr. Harwood. Motion carried.

Dr. W. R. Somerville moved that the President, 1st and 2nd Vice-Presidents and Secretary-Treasurer be appointed a Committee to carry on the work of all the Committees until the next meeting, with power to appoint such com-

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mittees as may be required. Seconded, Dr. F. Harwood. Motion carried.

The following expense accounts were approved:—Dr. John W. Clay, postage, telegrams and stenographic service, \$40.00; Miss Gladys M. Littler, stenographic services, \$25.00; Miss O. Pascoe, stenographic services, \$6.10; Dr. J. Stanley Bagnall, postage and telegrams, \$21.00; Dr. J. Stanley Bagnall, honorarium and expenses to Toronto, \$200.00.

Dr. Somerville moved that the Association cheques be signed by the Secretary-Treasurer and countersigned by the President. Seconded, Dr. Harwood. Motion carried.

Dr. John W. Clay reported that the American Dental Association requested a number of clinicians for the American Dental Association meeting at Detroit. He stated that Dr. Fred J. Conboy had advised him that Ontario was willing to send a number of clinicians and register them as from the Canadian Dental Association. The Secretary was instructed to notify the General Chairman of Clinics of the American Dental Association to this effect and forward a letter of appreciation to the Ontario Dental Society for the action they were taking.

Dr. Archie Johnson moved that the time and place of the next meeting be left to the Executive. Seconded by Dr. Mowry. Motion carried. Meeting adjourned.

The Minutes of the Adjourned General Meeting, King Edward Hotel, Toronto, 4.30 p.m., August 19th, 1927, are as follows:

Minutes of the previous general meeting were read and approved. Minutes of the Executive meeting read for information. Dr. Archie Johnson moved the following resolution:

“This Association feels that there is a vital need for the appointment of a dental officer who will be in charge of dental services for institutions and individuals who come under federal control, such as penitentiaries, schools for Indians, Indian reserves, Royal Canadian Mounted Police, and the Department of Soldiers’ Civil Re-establishment, and the need of the development of a dental service in the Federal Department of Health.

“Therefore, be it resolved:—That this Association respectfully recommends to the Honorable the Minister of Health, Dr. J. H. King, that such an appointment be made and that the Executive Committee be empowered to take such further action as may be necessary.”

Seconded, Dr. Wallace Secombe. Motion carried.

Dr. Archie Johnson moved that the resolutions as presented by Drs. Winnett and Johnson be handed to the President. Seconded, Dr. F. Harwood. Motion carried.

Dr. Mowry explained that the object of the motion in

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the Executive Council to re-elect the present officers of the Association was to enable them to complete the work already commenced in connection with the re-organization of the C.D.A. Dr. Mowry moved that the present officers be re-elected for the ensuing year. Seconded by Dr. F. Harwood. Motion carried.

Dr. Archie Johnson moved that the suggestion of the Executive Council re appointment of an Executive Committee to carry out the work of the various Committees till the next meeting and that they have power to appoint such other committees as are necessary be approved. Seconded by Dr. Wright. Motion carried. Meeting adjourned.

* * *

Financial Statement, Canadian Dental Association

Receipts—

May 7, 1927.

Balance received from Dr. E. A. Grant as per last audit— ed statement	\$1,005.21
Interest	32.66
Receipts from 1926 Convention	2,463.69
	\$3,501.56

Expenditures—

Exchange on cheques	1.25
Florist, wreath	10.00
Stationery and printing	229.92
Stenographic and clerical	85.05
Fyling cabinet	15.00
Postage and telegrams	116.36
Convention expenses	1,969.20
Honorarium, Sec.-Treas.	250.00
Balance in Bank of Nova Scotia	824.78
	\$3,501.56

G. A. CHUDLEIGH, Auditor.

J. STANLEY BAGNALL, Sec.-Treas.

* * *

Proposed Changes in the Canadian Dental Association Constitution

J. STANLEY BAGNALL, D.D.S., HALIFAX,
Secretary, Canadian Dental Association.



HY should changes be necessary in the Constitution of the Canadian Dental Association? The Association as it stands to-day is a tribute to the far-seeing men who saw the need and built to meet conditions as they were at that time, and it has filled a very vital place in the development of Canadian Dentistry.

When we think of a national dental organization we find that it embodies two more or less clearly defined ideas. We think on the one hand of a convention, and on the other of what may be rather loosely defined as the business of the Profession. The term *business* is not a good one, but it is intended to include a variety of activities. A national organization may be interested in many schemes for the advancement of the Profession, as well as for the protection of its interests. If an organization is to be national in scope, it must have: 1—A large and active membership, thoroughly representative of all parts of the country; 2—Proper provision in its Constitution for the carrying on of the activities in which the Profession is interested; and 3—A sound scheme of financing.

The emphasis in the past has been placed on the Convention idea and but little attention paid to these other activities of the Profession. The Executive consisted of a body hastily formed during the convention, without time or opportunity to become conversant with the various activities of the Association and to formulate plans for their advancement before they were practically disbanded by the termination of the convention. The membership was never at any time large nor representative of the country as a whole. The net result has been that but little attention has been paid by the Association to the many beneficial activities which it might have considered, and as distances are so great the plan of holding one national convention every two years left much to be desired.

It was to overcome these difficulties and suggest something which could be a real help to the Profession that the proposed changes now outlined in the magazines were prepared. The work has been progressing steadily since it was first advocated by Dr. Bradley in his presidential address in Vancouver in 1924, at the Canadian Dental Association meeting. It was advanced another step by a motion introduced by Dr. Wallace Seccombe at the meeting in Halifax in 1926. This led to a meeting of delegates from most of the Provinces at Toronto last May, and the Provinces not represented at that time have since assured us of their sympathy with the scheme.

It was my privilege to listen to the discussion of this group of Provincial representatives and to the suggestions of some of the men since elected to meet with this body, and I could not help feeling that the Profession in Canada was indeed fortunate to have so many able men so interested in its advance.

While the scheme proposed follows very closely the trail already so well blazed by our medical confreres, whose problems are similar to our own, it, at the same time, preserves many features of our former Constitution.

We have heard it said that a thing well started is half done. It has taken hard work to bring the scheme to its present stage, and it is doubtful if ever before there has been such a widespread interest on the part of the Profession in every section of Canada to get together and advance our common aims and ideals. It is peculiarly fitting that, in this year when the Confederation celebration has so concentrated our thoughts on the unity of Canada, we as dentists should be striving to remodel our own Association so that we, in the fullest way possible, may take our part in the growth and development that is to come. The scheme is not for the few, but for every one. No national organization can meet its fullest success unless each and every dentist in this fair country lends his active support to its development. We may not all agree with the scheme as proposed, and there will be ample opportunity to discuss those points later, but we can all agree that there is a real need for an organization which will, in a national way, do its bit to advance our Profession to that position we all wish it to occupy.

* * *

Report of Meetings of Delegates

CHAS. H. MOORE, D.D.S., WINNIPEG,
Secretary, Meeting of Delegates, C.D.A.



ELEGATES from the various provinces of Canada, excepting Nova Scotia and Prince Edward Island, met in Toronto during May, 1927, to re-organize the Canadian Dental Association. A revised Constitution and By-Laws were drafted.

The following representatives were present:—

T. R. Peden, representing British Columbia.
A. Johnson, representing British Columbia.
M. J. Gibson, representing Alberta.
John Clay, representing Alberta.
W. P. Broderick, representing New Brunswick.
Harry Thomson, representing New Brunswick.
F. C. Harwood, representing Saskatchewan.
F. J. Conboy, representing Ontario.
Harold Clark, representing Ontario.
E. Charron, representing Quebec.
Phillipe Hamel, representing Quebec.
D. P. Mowry, representing Quebec.
W. W. Wright, representing Manitoba.
C. H. Moore, representing Manitoba.

Dr. Clay moved—"That this Board of Delegates express regret that Nova Scotia and Prince Edward Island have been unable to send delegates to this meeting and hope that at a later time they will join us and approve of the result of our deliberations."

Dr. Thomson seconded the motion with the addition, "That everything must be submitted to the other provinces and their interests protected."—Carried.

At the final meeting of the delegates, on May 17th, Dr. Clay moved that the Constitution be approved; seconded by Dr. Charron. Moved by Dr. Harwood, seconded by Dr. Charron, that the By-Laws as drafted be approved.—Carried.

Ontario and Alberta have since officially accepted the Constitution and By-Laws and the delegates of the other provinces are supporting their adoption at the general meetings of their societies when such are held.

The Constitution and By-Laws to be published in three Canadian Dental Journals, on the authority of Dr. Clay, President, Canadian Dental Association.

* * *

Proposed Constitution of the Canadian Dental Association

Article 1.

This Society shall be known as the Canadian Dental Association.

Article 2.

The particular objects of this Association shall be: To cultivate and promote the art and science of Dentistry and all its collateral branches; to conduct, direct, encourage, support or provide for exhaustive dental and oral research; to elevate and sustain the professional character and education of dentists, — to promote among them mutual improvement, social intercourse and goodwill; to disseminate knowledge of Dentistry and dental discoveries; to enlighten and direct public opinion in relation to oral hygiene, dental prophylaxis, and advance scientific dental service; to have cognizance of and safeguard the common interests of the members of the Dental Profession; with express power to acquire property for the purposes of the corporation by purchase deed, gift, bequest or otherwise, and to hold and administer the same, and to publish dental journals, reports and treatises, and such other lawful means as are conducive to the attainment of the above objects.

Article 3.

The code of ethics of the Association shall be such as may be adopted by the Association from time to time. An official copy shall be kept in the possession of the Secretary, and shall be open to inspection at all time.

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Article 4.—Membership.

The Association shall be composed of active, honorary and associate members.

1. Active members must be regularly qualified dentists in Canada, those engaged in teaching of research work in Dentistry, or the allied sciences, in Canada.

Senior members shall be active members who, having attained the age of 70 years, may be elected by unanimous vote of council present and voting.

2. Honorary members must be persons who have distinguished themselves and risen to pre-eminence in Dentistry, the allied sciences, literature or statesmanship.

3. Associate members must be regularly qualified practitioners of Dentistry or of the allied sciences, not resident in Canada.

4. Honorary and Associate members shall have all the privileges of the Association except the exercise of the franchise, and they shall not be eligible for election as officers or members of any Committee.

Article 5.—Branch Associations.

Any interprovincial, provincial or local Dental Association in the Dominion of Canada may, by official resolution of such Association, become a Branch of the Canadian Dental Association by subscribing to its Constitution, By-Laws, and code of ethics, and by securing the approval of the Board of Delegates. They shall submit to the Board of Delegates a copy of their Constitution and By-Laws and such amendments as may be made from time to time.

Article 6.—Affiliated Societies.

Any nationally organized dental, medical, scientific or sociological body, may become affiliated with the Canadian Dental Association by securing the approval of the Board of Delegates. They shall submit a copy of their Constitution and By-Laws and such amendments as may be made from time to time.

Article 7.—Meetings.

The meetings of the Association shall be held at such time and place as shall be determined by the Board of Delegates.

Article 8.—Officers.

The Officers of the Association shall be a President, a President-elect, a Vice-President for each Province, a Chairman of the Board of Delegates, and a General Secretary and Treasurer.

Article 9.

The Board of Delegates shall consist of:

a. The Officers.

b. The Delegates from the various Provinces as follows:— Each Province shall be entitled to elect or appoint one delegate to the Board of the Canadian Dental Association for that Province, excepting the Provinces of Ontario and Quebec, which shall each be entitled to elect or appoint two delegates, one senior and one junior. The senior delegate shall be the Vice-President of the Canadian Dental Association for that Province. Payment of expense account of one delegate only from each Province will be made by the Canadian Dental Association.

Article 10.—Committees.

The Committees shall be:

a. Standing.

b. Special.

c. Reference.

All Committees when not otherwise specified shall be appointed by the Board of Delegates and consist of not more than five members and shall report to the President or Board of Delegates when required.

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Article 11.—Funds.

Funds for the purpose of the Association shall be raised by an annual fee from each active member, the amount of such fee to be determined by the Board of Delegates; from the Association's publications and in any other manner approved by the Board of Delegates.

Article 12.—The Association Year.

The Association year shall be the calendar year.

Article 13.

No amendments to any of the foregoing articles or sections thereof shall be made, unless due notice has been given in writing to the General Secretary at least six months before the meeting at which they are to be discussed.

Any such notice of motion must be forwarded by that Officer to members of the Board of Delegates and the Secretaries of the Official Provincial Organization, also published in at least two Canadian Dental Journals chosen by the Executive Committee. No amendment shall become effective until sanctioned by a three-fourths vote of the Board present and voting, and ratified by the Association in open meeting.

* * *

Proposed By-Laws of the Canadian Dental Association

Chapter 1.—Membership.

Section 1.—Any ethical dentist residing in Canada may become an active member of the Canadian Dental Association, providing:

(a) He is a member in good standing of a voluntary dental association in the Province where he resides, if such association exists. Where such association does not exist, he may be elected to membership by the Board of Delegates on nomination of two members of the Canadian Dental Association in good standing.

(b) That he pays the annual fee and subscribes to the Constitution, By-laws and code of ethics of the Canadian Dental Association.

If by March 31st, the annual fee for the current year has not been paid, membership automatically lapses. Re-instatement at any time during the current year may be obtained by payment of the current fee.

Section 2.—Senior life members shall enjoy all the rights and privileges of the Association, but shall not be required to pay any annual fee.

Section 3.—Associate members may be elected by the Board of Delegates from among regularly qualified dental graduates residing outside of Canada.

Associate members shall have no voting power and shall not be called upon to pay any fees.

Section 4.—Any delinquent member having once failed to comply with the sections of this article shall not be restored to membership until all such dues, as may be determined by the Board of Delegates, have been paid, and satisfactory evidence produced that he retains his membership in his voluntary association, if admitted through such channel.

Section 5.—Honorary members may be nominated by any member of the Association and shall be elected only by unanimous vote of the Council present and voting. Not more than five honorary members may be elected in any one year, and at no time

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shall the list of living honorary members exceed twenty-five. Honorary members shall enjoy all the rights and privileges of the Association, but shall not be required to pay an annual fee.

Section 6.—No member shall take part in the proceedings of the Association, nor in the proceedings of any of the sections thereof until he has properly registered and paid his annual dues.

Section 7.—The membership fee shall be 50 cents per member per year. This fee, where possible, may be collected through the voluntary organization in the various Provinces.

Section 8.—Membership of all classes may be declared forfeited by the Board of Delegates for reasons considered sufficient by that body.

Chapter 2.—Guests and Visitors.

Section 1.—Dental practitioners and other men of science residing outside of Canada, may attend the annual meeting as guests of the President or of the Board of Delegates, or as visitors when vouched for by the General Secretary. They shall register with the General Secretary, without payment of fee, and may, after proper introduction and the consent of the Chairman, be allowed to participate in the discussions of a purely scientific nature.

Section 2.—Lay members of affiliated associations or societies may, upon the invitation of the President and Chairman of Programme Committee, attend the annual meetings and participate in the discussions of a purely scientific nature.

Section 3.—Dental students who are eligible to attend their provincial society, may be admitted as visitors to either the general meetings or to the meetings of any of the sections thereof, and on the same terms as to their provincial society, but shall not be allowed to take part in any of the proceedings. They shall be vouched for by a member of the Association to either the President or the General Secretary.

Chapter 3.—Meetings.

Section 1.—The time and place of meeting shall be decided upon by the Board of Delegates, and shall be announced as early as possible.

Section 2.—When the Canadian Dental Association meets in any Province where there is a Branch Association, the meeting may be held in conjunction with that Branch Association, and the local association or society may have control of the arrangements under the direction of the Dental Association of the Province and the General Secretary of the Canadian Dental Association.

Section 3.—The meetings shall consist of general sessions and scientific sections.

Section 4.—The President shall preside at all general meetings. In his absence, or upon his request, one of the Vice-Presidents shall preside.

Section 5.—The Rules of Order which govern the proceedings of the House of Commons of Canada shall be the guide for conducting all meetings of the Association.

Chapter 4.—Meetings of Sections.

Section 1.—The sections to be held at any meeting shall be appointed by the Association or Society in charge of the meeting.

Section 2.—The Chairman shall preside at all meetings of the section, and with the aid of the Secretary of the section shall arrange for the papers and business of the section.

Section 3.—The Secretary shall keep a correct account of the transactions and record them in a special minute book provided by the General Secretary. The Chairman must verify and sign the minutes, which must be returned to the General Secretary at the close of the meeting.

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Chapter 5.—Election of Officers.

Section 1.—The President-elect, and Chairman of the Board of Delegates, shall be elected by ballot without nomination by the Board of Delegates. Other officers of the Association shall be appointed by the Board of Delegates.

Section 2.—Any five members of the Association may hand to the General Secretary, in writing, not later than the first day of the meeting, the name of a member whom they may wish to nominate for any office.

Chapter 6.—Duties of Officers.

Section 1.—The President shall preside at the general sessions of the Association and shall perform such duties as custom and parliamentary usage require. He shall deliver a Presidential address. He shall be a member ex-officio of all committees.

Section 2.—The President-elect shall be installed and shall assume the office of President at the close of the last general session of the meeting next following his election.

Section 3.—The Vice-President of the Province in which the meeting is held, shall be the first Vice-President of the Association for that year and shall assist the President in the performance of his duties.

Section 4.—The Chairman of the Board of Delegates shall preside at all meetings of the Board of Delegates and shall be ex-officio a member of the Executive Committee.

Section 5.—The Treasurer shall receive and collect from the members the annual fees and demands of the Association. He shall be the custodian of all moneys, securities and deeds, the property of the Association. He shall pay by cheque only on authority of the minutes and covered by voucher.

He shall prepare an annual financial statement audited by a Chartered Accountant.

He shall furnish suitable bond for the faithful discharge of his duties, the cost of which shall be borne by the Association.

He shall receive for his services an honorarium to be determined by the Board of Delegates. He shall be reimbursed for his legitimate travelling expenses incurred in attending the meeting.

Section 6.—The General Secretary shall also be the Secretary of the Board of Delegates and also of the Executive Committee of the Association. He shall give due notice of the time and place of all meetings, by publishing same in the official journals of the Association, or if necessary by notice to each member. He shall keep the minutes of each meeting of the Board of Delegates and the Executive Committee in separate books, and shall provide minute books for the Secretaries of the different sections which he shall see are properly attested by both the Chairman and Secretaries thereof. He shall notify the officers and members of the Committee of their appointment and of their duties in connection therewith. He shall conduct all correspondence of the Association and shall publish the official programme of each annual meeting. He shall preserve and index the archives, the public transactions, essays, papers and addresses of the Association, and shall perform such other duties as may be required of him by the President, the Board of Delegates and the Executive Committee.

Chapter 7.—The Board of Delegates.

Section 1.—Appointment of Delegates:

(a) In those Provinces which have a voluntary province-wide organization, the delegate or delegates shall be appointed by this voluntary organization.

(b) In those Provinces where there is no province-wide voluntary organization, the delegates shall be appointed by the Provincial Legal Association, unless this power be delegated by the Provincial Association to some other body.

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Section 2. The Board of Delegates shall meet at least one day previous to the opening of the meeting of the Association, and thereafter while the Association is in session the Board of Delegates may meet daily. During the interval between the meetings, the Board of Delegates shall meet at the call of the Executive Council.

Section 3. For all the meetings of the Board of Delegates, due notice shall be sent to each member, stating the business of the meeting.

Section 4. The Board of Delegates shall have supervision of all properties and of all financial affairs of the Association. It shall, through its officers, conduct all the business and correspondence. It shall keep a record of the transactions of all its meetings and of the receipts and expenditures of all funds, and shall report upon same in journals after the meetings. In case of a vacancy in any office, on account of death or otherwise, during the interval between the meetings of the Association, it shall have the power to appoint successors. Before the close of each meeting, it shall elect a President-elect, and if possible select a place for the next meeting and present a list of all standing and special committees and the members thereof.

Section 5. In order that the business of the Association may be facilitated during the interval between the meetings, the Board of Delegates shall appoint a Committee of five from among its members, which shall be known as the Executive Committee, and the Chairman of the Board of Delegates shall be the Chairman of the Committee. In all the business affairs of the Association, it shall represent the Board of Delegates, and to it shall be delegated all the rights and powers of the Board of Delegates. The President and President-elect shall be ex-officio members of the Committee. The Executive Committee shall report to the Board of Delegates at the meeting and at such other times as the Chairman of the Board of Delegates may request. The Chairman of the Board of Delegates, at the request of five members of the Board of Delegates, may call a special meeting at any time, at which the Executive Committee may be annulled or changed, and for such other purposes as are intimated in notice of meeting.

Section 6. The Executive Committee may, if necessary, refer important questions for mail ballot to the Board of Delegates.

Chapter 8.—Committees.

Standing Committees. The Standing Committees shall be as follows:

- (1) A Committee on Arrangements.
- (2) A Committee on Dental Legislation.
- (3) A Committee on Dental Health.
- (4) A Committee on Research.
- (5) A Committee on Inter-Provincial and Foreign Relations.
- (6) A Committee on Programme.
- (7) A Committee on Dental Education.

The Committee on Arrangements shall consist of five members, who shall be residents of the place in which the meeting is to be held. The President shall select two, who will select the other three. The Committee shall select its own Chairman.

The Committee shall be required to provide for transportation and the necessary accommodation for the meeting.

The General Secretary shall act in an advisory capacity to the Committee.

The Committee shall have power to add to its members.

Committee on Legislation. To the Committee on Legislation shall be referred all matters pertaining to local and federal Dental Acts.

Committee on Dental Health. It shall be the duty of this Committee to place itself in communication with the Federal Department of Health, and with the various affiliated societies, and where none exist with the prominent men of the Profession, seeking information regarding public health, and to present a report embodying anything in regard thereto that would be of interest.

The Committee on Research. The Committee on Research will take charge of all research work under the general direction of the Executive Council when required. The Committee shall have power to add to its members and to name its own executive.

The Committee on Inter-Provincial and Foreign Relations. It is the duty of the Committee on Intra-Canadian Relations to endeavour to promote in the different Provinces of the Dominion a better understanding of the other's problems, thus making for a greater bond of sympathy, and a stronger feeling of unity and co-operation among the members of the Profession throughout the Dominion.

The Committee on Programme. It shall be the duty of the Committee on Programme to secure speakers, essayists, clinics, and exhibits for the general meeting, and report from time to time to the General Secretary, who will have the programme arranged, published and distributed to the Profession.

Committee on Dental Education. To the Committee on Dental Education shall be referred all matters pertaining to Dental Colleges and Dental Education.

Special Committees. Special Committees may, from time to time, be appointed by the President, the Council, or by the Executive Committee. They shall select their own chairman and shall perform the duties for which they are called into existence.

Addresses and Publications.

Section 1. All addresses delivered at a meeting shall immediately become the property of the Association, to be published or not, in whole or in part, as deemed advisable by the Executive Committee.

Section 2. All papers, essays, photographs, diagrams, etc., presented in any section, shall become the property of the Association, to be published or not, as determined by the Executive Committee, and they shall not be otherwise published except with the consent of the Executive Committee.

Section 3. Each author of a paper read before any section shall, as soon as it has been read, hand it with any accompanying diagrams, photographs, etc., to the Secretary of the section before which it has been presented, who shall endorse thereon the fact that it has been read in that section, and shall then hand it to the General Secretary.

Section 4. Official Resolutions approved by the Board of Delegates.

No memorial resolution or opinion of any character whatsoever shall be issued in the name of the Canadian Dental Association, unless it has been approved by the Board of Delegates.

The Committee on Necrology. To the Committee on Necrology shall be assigned the duty of collecting, as far as possible, the obituaries of members who have died since the last meeting. These shall be duly filed by the General Secretary. The Committee shall report on the call of the President at the last session of each general meeting.

Chapter 9.—Reference to the Association.

Upon the written request of ten per cent. of the members in good standing present at a meeting, the President shall direct that any business transacted by the Board of Delegates be submitted to a general business meeting of the Association.

Chapter 10.—Amendments.

Amendments may be offered by any member of the Board of Delegates and shall be in the hands of the General Secretary three months before the meeting at which they are to be discussed, and published in the Dental Journals and incorporated in the notice of meeting sent to the Board of Delegates.

Chapter 11.—Order of Business.

The order of business of the first general session of each meeting shall be as follows:

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- (1) Calling the meeting to order by the President.
- (2) Addresses of welcome and response.
- (3) Report of the Committee on Arrangements.
- (4) Reading the minutes of the last general session.
- (5) The Report of the General Secretary of the last general meeting.
- (6) Presidential or other addresses, if decided on by the President and Committee on Arrangements.

The order of business for all subsequent general sessions shall be the same as that for the first general session.

CODE OF ETHICS.

Article 1.

(a) The dentist should be ever ready to respond to the reasonable wants of his patrons, and shall fully recognize the obligations involved in his duties towards them; as in many cases they are unable to comprehend the operative service performed, or to correctly estimate its value. The practitioner must be guided by his own sense of right in treating the case as his own superior knowledge dictates. He should gain the confidence of his patrons, not alone by the skilful performance of difficult operations, but also by attending carefully to the simple cases committed to his care.

(b) The dentist, without being obtrusive or pedantic, should impart such information to his patrons as his opportunities afford him in regard to the causes and nature of the disease in the teeth or the adjacent parts which he may be called upon to treat, and should explain to them the importance of availing themselves of such timely preventatives or remedies as he deems necessary to their welfare. He should also communicate such general information as shall enable them to exercise an intelligent appreciation of what the Profession aim to accomplish.

(c) The dentist should be temperate in all things, keeping both mind and body in the best possible health, that his patients may have the great benefit of the clearness of judgment and skill which they have the right to expect.

Article 2.

(a) Every member of the Dental Profession is bound as such to maintain the honor and integrity of the Profession. To this end he should himself be upright and courteous in his intercourse with the public and his brethren in the Profession.

(b) It is unprofessional to resort to public advertisements, such as cards, handbills, posters, or signs, calling attention to peculiar styles of work, photos, lithographs or engravings made of wood, steel, or other materials advertising free operations, prices for services, special modes of operation, or to claim superiority over neighbouring practitioners, to publish reports of cases or certificates in public prints, to go from house to house soliciting or performing operations, to circulate or recommend nostrums, or perform other similar acts. But nothing in this section shall be so construed as to imply that it is unprofessional for dentists to announce in public prints or by cards, simply in names, occupation and their place of business, or in that manner announce their removal from or return to business, or to issue to their patients appointment cards.

(c) The dentist when applied to merely for advice or temporary relief by the patient of a reputable practitioner, whose services he at the time is unable to secure, should guard against disparaging the family dentist by his enquiries or other means calculated to weaken the patient's confidence in him. At the same time the dentist should not, from too high a sense of professional courtesy to his neighbouring practitioner, allow the interests of persons applying for counsel or service to be jeopardized.

(d) It is ever to be regarded as unprofessional to warrant operations or work as inducement to patronage. It is also unprofessional to violate or to be a party to the violation in letter or spirit of the dental law.

The Relation of Food to Tooth Decay*

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IN the preparation of this paper many authorities have been consulted, most of whose names have been intentionally omitted. Their mention, in support of any statement, would not contribute anything of value, since to the general public their recital would mean nothing. For the same reason simple language has been used in preference to technical terms, insofar as has been consistent with the text, in order that the facts set forth may be more readily understood and their logic appreciated by this audience.

Tooth decay, or dental caries, is such an universal affliction, so costly to the nation in time and money, so destructive in its ravages, and too often found to be the seat of serious systemic disorders, that in nearly every university in civilized countries research departments have been established with the object of finding some definite means by which this most universal of all afflictions may be lessened or entirely eradicated. No one contributing factor has been given such prominence during the past few years as diet: and no other offers so much hope for solving this important problem. The work of the Committee of the Privy Council in Great Britain for the Investigation of Dental Disease has added considerably to the history and prevention of decay of the teeth and diseases of the surrounding tissues, and it is significant that nearly ninety per cent. of all decay was found to be in the areas of imperfect formation or calcification. Thus, the relation of diet and nutrition to normal tooth development is forcibly emphasized. In the present growing movement for a better and more economical diet, the hopeful factors are, first, a recognition of its need and, second, a demand on the part of the public for the truth. One of the most important economic problems before the public is the purchase of food at moderate cost. On the average, half or more of the family budget is spent for food and on a small income it is the largest single item.

But not until the public is prepared to accept the findings of committees, and independent investigators from all parts of

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the world, and is willing to be guided by their evidence to the extent of instituting a diet for themselves and their children, will any step forward in the reduction of diseased teeth be made.

There is no more fundamental process than that of the conversion of the raw materials of the diet into tissue. It is on this process that life itself depends. . . . Following the feeding of faulty diet to animals, tissue changes were found in various parts of the body, such as in the eyes, the digestive system, the nervous system, and in the bones and in the teeth. Growth is arrested and, if the disturbance has not been too severe, or of too long duration, these faults are corrected by improving the character of the diet. On the other hand, animals that are fed on a normal diet grow well, are extremely resistant to infections, and their organs are found to be in a state of health. The evidence that the diet is of fundamental importance in health is conclusive.

The growing movement in modern life towards living in congested districts, has removed the people further away from the source of supply of their foodstuffs, which have to be transported long distances and kept in stock for long periods to meet local demands, and, that this may be accomplished, marked chemical changes in the composition have been necessary, resulting in a loss of vital elements so influential in maintaining the well-being of the individual. This demineralization has been further increased by the method of preparing and cooking the food for human consumption. There is no doubt that our modern dietary is harmful, as far as the teeth are concerned, and they will tend to become worse, unless the diet is modified. The history of man's dietary decline is, indeed, but another instance of the unreliability of instinct when not balanced by reason and scientific knowledge.

Until quite recently the study of nutrition concerned itself chiefly with the knowledge of the chemical constituents of food-stuffs and its caloric, or food, value. It was found, however, that a definite understanding of a food on this basis alone was inadequate, for there were other factors, as yet unidentified, which had a profound influence upon its character and in the absence of which, included in the diet, life was impossible. These are commonly called *vitamines*; and their presence was only discovered by the biological method of experimentation. The results obtained from this experimental

feeding have been so remarkable as to convince the most sceptical. No one, acquainted with the achievements of nutritional experts in producing and remedying dental defects, but feels that the future is full of promise. There is hardly a feature that cannot be altered by a change in the character of the diet of puppies, guinea-pigs, rats, and monkeys used for this purpose. Animals have been made to grow tall, or to grow for a period at a normal rate, and then to be kept stationary; the growth of others, on the contrary, can be made to remain small and disturbance can be created, as mentioned before, to affect almost any organ or part of the body. The teeth are evidently the first part of the body to degenerate and can be taken as an index to the nutrition and health of the individual.

Decay of the teeth is directly responsible for the lactic acid excretion of bacteria, which feed on food-stuffs of a carbohydrate nature, such as bread, cake, biscuits, etc., which cling to the surfaces of the teeth, especially in locations where the friction of the tongue, cheeks and lips exerts no influence, and it is in these areas that faulty formation and imperfect calcification are most often found. For this reason grooves, fissures and pits are most susceptible, and a perfectly formed tooth is exceptionally found. Organisms capable of producing an acid of sufficient strength to attack the teeth are almost universally present in the mouth, and attempts to destroy these or prevent their growth by external agencies, such as antiseptics, have not been successful. On the other hand, the food factor can be controlled and, when it is generally known and understood that decay can only result from the bactericidal action, as outlined above, the significance of hygienic care as a prophylactic measure will be appreciated. Notwithstanding, however, the most careful and painstaking efforts towards keeping the teeth free from food deposits, decay will, in some mouths, proceed with alarming rapidity.

Thus, then, if one is to practise true prevention, a knowledge of the influence of nutrition on the formation of teeth, immune to disease, is imperative.

Professor and Mrs. Mellanby, of Liverpool, have concluded from their extensive experimental feeding of puppies and children:

First, that decay of children's teeth is primarily a problem of defective feeding which results in imperfect formation.

Second, that the dietetic factors, responsible for the formation of sound teeth, also confer resistance upon teeth already erupted.

Third, that foods containing fat-soluble vitamins, such as milk, egg-yolk, butter, animal and fish fats, and especially cod liver oil, bring about the formation of sound teeth; while cereals, and especially oatmeal, in the absence of this vitamin, bring about the formation of poorly calcified teeth.

McCollum, of Johns Hopkins University, Baltimore, has stated that in England and in America the school authorities and parents are being urged towards a goal of repair and cleanliness; that this movement in its present form will call for more and ever more investment of time, money and human effort, without any prospect of relief from the burden, which relief can only be brought about by giving attention to the problem of forming sound teeth during the period of growth. This involves the application of scientific nutrition to the diet of the expectant and nursing mother and to that of infants and children.

The importance of diet is emphasized by the fact that the formation of the child's first set of teeth, and some of the second set, have already begun before birth, so that it is clear that good teeth are determined, to a great extent, before the child is born. This is the most critical stage in the development of the masticatory apparatus which, unfortunately, is outside the field of the dental practitioner.

It is obvious then, that if a sound tooth in a healthy child is to be had, it will be too late to begin when he has reached school age. The prenatal diet is perhaps the most important factor in this problem, and the expectant mother should be advised as to her choice of foods, in order that the amounts and kinds will be adequate for her own needs as well as those of the developing infant. The development of the teeth so early in life makes it imperative to control any agencies which may, during this period, influence adversely the dental history throughout life.

Of the sixteen different elements that, in various combinations, go to make up the complex human organism no one is so often lacking, or so necessary to sound teeth, as calcium. Not only is calcium (in combination with phosphorous) the

chief constituent of bones and teeth, but it is also essential in maintaining an alkaline reaction of the blood.

The most valuable source of calcium is milk, which is derived from grasses eaten by the cow, and which is for this reason more abundant in the milk in Spring and Summer, when the animals are in pasture, than during the stall-fed Winter months. Its vitamine content is also influenced by this change of diet, as well as by the effect of the exposure of the cow to the ultra-violet radiation in sunlight.

It is interesting in this connection to mention the novel procedure of exposing cows during Winter to ultra-violet rays artificially produced, as advocated by Dr. Cowell of London, in order that the milk, which is to be used for sickly children, should be thus altered chemically and have curative powers imparted to it.

To ensure a sufficient amount of calcium with a margin of safety, the daily consumption of milk should be four glasses, taken at meals or used in cooking. It is of importance to remember that a child between the ages of three and thirteen probably needs as much calcium per day as two grown men. The amount of calcium, however, entering the diet is not an index to the amount digested or assimilated, inasmuch as several factors influence the utilization of calcium or are instrumental in its fixation. With the contribution of the endocrine or ductless glands upon calcium digestion, nothing need be said in a paper of this kind except that an imbalance of these glands profoundly affects bone development. Sunlight, however, is a factor deserving of much consideration. Much has been written on the effect of sunlight on health and, since it has an important bearing on the development of the teeth, a brief description of its therapeutic value is in order.

Of diseases due to dietetic deficiencies none is so prevalent as rickets. Authorities have estimated that from fifty to eighty per cent. of all American children have this disease in some degree of severity sometime in infancy or childhood. McCollum says that few people realize the gravity of the situation as respects rickets among children. Almost all children in industrial districts of England and of Scotland suffer from this disease. It is most common between the seventh month and the end of the second year of life, but may occur earlier or later. It can be produced at will experimentally in animals by subjecting them to a faulty diet, which

interferes with the digestion of calcium and phosphorous. Similar experiments have made it clear that it is not likely to develop when the diet contains a sufficient amount of vitamine D, the most valuable source of which is cod liver oil, or when the subject is exposed to sunlight. The therapeutic action of the ultra-violet rays, which are valuable only between eleven in the morning and two in the afternoon, affects the individual in such a way that the absorption of calcium is made possible. About one per cent. of solar radiation is made up of the short, invisible ultra-violet rays, and knowledge of the effect of light on the growth and development of the body has been gained largely through the study of rickets. Rickets occurs chiefly during the Winter and Spring, and is confined almost entirely to the temperate zones, which would seem to indicate the necessity for ultra-violet radiation in the fixation of calcium; for, during these dark months, most of the ultra-violet rays are lost during the longer journey from the sun to the earth's surface. What little reach the earth are filtered out by window glass and the clothing worn during the cold season. Hence, the advisability of including in the diet of the expectant mother, and also in that of the infant, a liberal amount of pure cod liver oil, for its value in the fixation of calcium and vitamine content. The necessity for this prophylactic measure is apparent when it is appreciated that, in this locality, less than one-half of one per cent. of solar radiation is available during the Winter months and this only at noon. For this reason, it is probably not inconsistent to suggest the great benefit to growing children if the hours for school were from nine to eleven in the morning and from two until five in the afternoon, thus making it possible for them to take advantage of these hours for outdoor recreation, at the time when the sun's curative properties are effective. While too great exposure to strong sunlight may be injurious, the danger during the Winter months is negligible.

In the selection of the various kinds and proportions of food to make a combination most favourable to growth and development, eight fundamental principles must be considered.

First, the normal diet should contain an adequate amount of proteins, fats, carbohydrates, mineral salts and vitamins to maintain an individual under usual activities at a normal weight for the age and stature. Children require about twice as much per square foot of surface area as an adult.

Second, the normal diet should contain sufficient protein to provide for growth and repair and, in this respect, children require more than their parents. Valuable sources of protein are milk, eggs, cheese, liver, kidney, sweetbreads and fish.

Third, the diet should contain about twenty-five per cent. of fat, chiefly of animal origin. The value of dairy products cannot be over-estimated and butter fat is the best source of this article. There are very few food-stuffs as cheap as butter, and substitutes should not be used. The food value of butter is 3,605 calories to the pound and easily heads the list of food in this respect, without taking into consideration the importance of its growth promoting vitamine.

Fourth, the balance of the diet, namely sixty to sixty-five per cent., should consist of carbohydrates, which should be secured from natural grain cereals, fruits, vegetables and natural sweets.

Fifth, to promote healthy intestinal hygiene, the diet should contain an adequate amount of bulky residue-containing foods to ensure natural bowel movement.

Sixth, the diet should contain ample minerals, the most important of which are calcium, phosphorous and iron, and which are found abundantly in milk, egg-yolk, green vegetables, whole wheat, molasses, fresh fruit and dried sweet fruits.

Seventh, the diet should be so balanced as to exclude an excess of acid-forming foods such as meats, eggs and cereals, to prevent a condition known as acidosis, which term is generally used to indicate any condition in which the body is less alkaline than it should be. The living body is always slightly alkaline, and should the tissues become acid to the slightest degree, death follows, and serious illness results long before the alkalinity of the body is reduced to the neutral point.

While most fruits are acid to taste, their end-product is decidedly alkaline, with the exception of cranberries, prunes, plums and rhubarb. Of the foods with an alkaline ash, figs by far head the list, and spinach, molasses, muskmelons, fresh pineapple, fresh peaches, lemons, carrots, **cauliflower** and oranges come next in the order named. When acid-forming foods are taken in excess, the alkalinity of the blood is lowered and, if continued, the system draws upon the teeth and bones to neutralize this acidity. This probably accounts for the disastrous result which follow the introduction of refined American food-stuffs into the diet of Southern European im-

migrants who have been accustomed to natural food-stuffs with plenty of greens and whose teeth upon arrival are perfectly sound. Stephanson reports similar results among the Eskimos, following the introduction of refined flour and sugar into their diet. Previous to this their language contained no word for "toothache". The future for these people is not pleasant to contemplate, isolated as they are and unable to receive dental attention.

Eighth, the diet should contain an ample amount of the vitamins to ensure normal growth. A brief description of these vitamins is as follows:

The fat-soluble vitamin A is found abundantly in dairy products, egg yolks, liver, kidney and sweetbreads, and in green leaves of plants, such as spinach, etc.

The water-soluble vitamin B is found in greatest abundance in the leaves of plants and the outer skin of cereals.

Water-soluble vitamin C is provided chiefly in citrus fruits, such as lemons, oranges and grapefruit, and in lettuce and tomatoes. Its absence in the diet gives rise to scurvy.

Fat-soluble D vitamin is found most abundantly in cod liver oil. Milk is a good source, and it occurs in small amounts in liver, kidney, sweetbreads, wheat kernel, dairy products, lettuce, fresh green peas and dandelion greens. Its absence produces rickets, and it can be made active by exposing part of the body unprotected to sunlight.

Vitamins A, B and D survive high temperature, but C is very unstable and is destroyed in cooking.

At the present time the subject of vitamins is being given much publicity in magazines and newspapers, and by manufacturers with products to sell, but if an adequate amount of milk, vegetables and fruit are taken to satisfy the fundamental principles of a normal diet, as outlined above, these can be ignored.

The prenatal diet should include plenty of milk, whole-grain cereals in preference to the refined ones, eggs, cottage cheese, abundance of fresh vegetables in addition to cooked ones, some fruit daily, preferably fresh, and, if required, some cooked fruit for constipation will be helpful. Refined sugar, jams and marmalade, may to advantage be replaced by natural sweets as found in honey, pure maple syrup, real molasses, raw sugar, figs, dates, raisins and sweet fruits. Meat should be eaten sparingly and cheese and sea food used instead.

When the nursing period has been reached, it is quite unlikely that the mother will be unable to supply an adequate amount of milk, and breast-feeding over a period of nine months should, if possible, be maintained. There is no substitute for human milk, nor for the exercise required on the part of the infant to obtain it. This natural method of feeding contributes much to the normal development of the bones of the face and head, and breast-fed infants thereby not only benefit physically but in mental capacity as well.

Later on, when weaning takes place, too often refined cereal products constitute the bulk of food added to cows' milk, and the diet is practically all of a soft and mushy nature requiring no exercise, and thus contributes nothing to the development of the head and facial bony structures. The weak faces of the present day are the result of such a diet continued throughout life. The natural instinct of the child to gnaw hard substances has for its outlet only its hands and what it can find within reach to work on. This procedure should be modified, in so far as is reasonable, and whole-grain cereal products used. Bread dried in the oven slowly until it is quite hard provides exercise and its flavour is enhanced by this treatment. Rye bread is also desirable as well as Ry-Krisp. Orange juice to prevent scurvy should always be given, and vegetable and other food added as directed by the family physician. If the water in which the leafy vegetables are cooked is saved and used in cream soups with chopped vegetables added, a valuable source of minerals is provided.

The diet outlined above for the period of pregnancy and lactation is most suitable for the child of school age. In many homes it is too often of a meat, potato and pastry nature and, as such, fails to provide the elements necessary for normal growth and the development of permanent teeth. A breakfast consisting chiefly, if not entirely, of fruit fresh and cooked, in which two or three figs are included, and at which a large glass of milk is taken, provides the body with a sufficient reserve of vitamins, roughage and minerals, that a shortage of these in other meals is amply compensated for. A luncheon is best of dried whole-wheat or rye bread or Ry-Krisp with cheese and a salad of lettuce, served sometimes with one vegetable, sometimes another, such as tomatoes, grated carrots, etc., and at others served with a slice of pineapple with mayonnaise dressing made with lemon juice instead of vinegar; and

milk; and the meal should be concluded with an apple, which not only is a valuable food but has a splendid cleansing action upon the teeth.

The evening meal may be an egg, some fish or meat, preferably liver, kidneys or sweetbreads, which meat is, of all kinds, the most valuable source of protein; potatoes, baked preferably and skins eaten, and at least one other vegetable; followed by the glass of milk sipped slowly and the meal concluded with a salad and some celery. The dessert course should be eliminated, if it be pastry, pudding, cake or food of a like nature, and some fresh fruit substituted therefore. There is probably no other food more valuable as a cleansing agent than apple eaten raw and, if this is eaten as well as a salad of fresh vegetables, the teeth are likely to need but little brushing.

As a prophylactic measure it has been found that the use of a sand glass, such as is used for timing eggs, gives admirable results. The glass is placed in the bathroom over the basin and turned upside down and the child instructed in the proper manner of brushing, which is to continue, without the use of tooth paste or powder, for the three minutes that it takes the sand to pass from one bulb to the other. This is done after every meal. When meals are concluded with a carbohydrate food, which clings to the teeth, even the above plan of brushing fails to perform what the salad and fruit does, and in susceptible mouths decay will occur.

The study of diet and its bearing on the structure of the bones involves a close observation upon the food habits of various races and of primitive peoples, and the evidence is convincingly in favour of the belief that the character of the food is closely associated with, if not solely responsible for, the presence or absence of dental disease.

This problem of diet is so stupendous, so embracing in its effects, so closely allied with the climatic, economic and social factors, that in a paper of this kind only sketchy reference to the various influences associated with it has been possible. As the people awaken to the bearing it has upon the physical growth and mental development of their children, it is not unreasonable to expect that with the close co-operation of the physician, the dentist, and the parent, with the will to learn and the courage to execute, decay of the teeth, like malaria, typhus and yellow fever, will gradually cease to take its toll of misery, disease and death from the human race.

The Sciences of Physics, Chemistry and Metallurgy Applied to Dentistry*

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It may reasonably be inferred that the granting of the privilege of presenting a subject for the consideration of dental teachers, does not imply that only those things, concerning which there is entire agreement, shall be brought forward for deliberation. Obviously, the prime purpose of these meetings is to discuss methods of teaching—a subject, with respect to which there is little likelihood of complete unanimity.

This topic naturally involves another frequent source of controversy—the curriculum. Therefore, the essayist, who ventures to include both of these subjects in one paper, as in the present instance, deserves the sympathy rather than the censure of the audience.

It is not altogether surprising that these two subjects should invariably prove contentious, when broached before an assembly of teachers, because the history of education contains many instances of pronounced hostility towards innovations in teaching methods, exhibited even by those who are foremost in the profession.

Conservatism and loyalty to tradition are even yet in evidence with educationists; it is a trait honestly acquired, however, by a process of natural inheritance. Therefore, it is not to be wondered at, if some teachers of dentistry are disposed to place too high an estimate upon the value of stability in education. They fail to recognize that the role of education is a dynamic and not a static one; or to let the new necessities of our profession dominate our educational policy. Dental education, to be truly effective, should contain the dynamic elements of experience rather than mere static truths. No matter how generously we may subscribe to the theory of evolution, we must admit that in educational affairs, things, if left alone, do not evolve; they disintegrate.

But, the mere fact of changing a curriculum does not signify

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progress; on the contrary, it is quite possible that misdirected zeal in this regard may result in retardation. Many changes may be merely the outcome of radicalism or reaction. They may even be dictated by forces outside the profession altogether; as such they are often whimsical and irrational, and never denote progress. Pedagogical motivation had best come from the teaching body itself and so be independent of any external stimulus.

It is but a commonplace to state that the purpose of a curriculum is to direct the learning process. Learning is active; it is the reaching out of the mind; it involves organic assimilation starting from within. Learning involves the capacity to analyze and synthesize. So, from the standpoint of psychology, the only significant method of learning is the method of the mind as it reaches out and assimilates. It is also a fact, that lessons are learned more readily, and remembered more completely, if the learner gets command of a definite technique, and uses, in his experiments, apparatus adequately designed to meet the requirements of scientific inquiry. He learns best by doing and seeing; not simply by listening. On this principle the course in applied physics, chemistry and metallurgy is based.

It may be stated as an incontrovertible fact that the older dental educational systems overlooked the dynamic quality, the developing force inherent in the learning process, consequently, there were a great deal of dead, mechanical, and formal studies in the curriculum. Most of the teaching was done with models, an exact likeness of which the students were required to produce. They became efficient in imitating but never in initiating. Under such conditions study became synonymous for what is irksome, and a lesson was always an unpleasant task. Much of the instruction given was of little value except as a disciplinary measure—just so much material to be raked over for examination purposes. It possessed no potentiality as regards the actual requirements of dental practice.

The normal law of the mind is to find satisfaction in its own exercise, hence the necessity for the assignment of problems, exercises, and experiments which are most likely to arouse interest and develop natural traits.

The true test of a course rests, not in a published curriculum, which sometimes is embellished with a list of subjects incompletely taught, but in the amount of assimilable instruction given. To this end, the conscientious teacher, noting the

students' difficulty in bringing their minds to bear upon the subjects as presented in the text-books, should resort to the legitimate device of transforming the material and so developing it that it will be within the range and scope of the student's capacity. It is a matter of common observation that even the most scientific facts, arranged by experts in the most logical sequence, lose their quality when presented in a cold, formal, ready-made fashion to disinterested students.

The problems facing the teachers of dental physics, chemistry, and metallurgy are many, but there are certain points which it seems worth while to test:

1. What can be done, and how can it be done, to bring the subjects into closer relation with the needs of the practising dentists?

2. What can be done in the way of introducing the essentials of these subjects in such a manner that they will be adequately comprehended, and have a positive value and real significance in the student's post-graduate career; that shall represent some knowledge or skill worthy of attainment?

3. How can instruction in these subjects be carried on with the general curriculum as a background, and yet have such instruction bear a positive correlation to the inherent content of the other courses; and, be carried on in such a way that the student shall feel the real need of these subjects through their connection with the practice of dentistry?

4. How can the student's interest be secured and concentrated upon what he is prone to consider as contiguous subjects that have little value in his work?

These four points represent a fair statement of what we must set out to investigate.

There is of course no intention of suggesting that the study of physics, chemistry and metallurgy, is not already provided for in the curriculum; indeed, for many years there has been a genuine appreciation of the value of these subjects in dental educational methods. They have, however, usually been taught as pure science subjects, rather than applied. As a result, there is often very little relation between the subject-matter of the courses and the actual requirements of our profession. It is very questionable whether those in charge of science departments have the inclination, or can devote the time necessary for the investigation of the many important problems

that are constantly arising in connection with the practice of dentistry.

Perhaps the situation as regards the teaching of physics, chemistry and metallurgy in many of our schools of dentistry should be viewed in this way: Every subject may be said to have two aspects—one, for the scientist, as a scientist; the other, for the teacher, as a teacher. These two aspects are not actually in conflict one with the other. Nor can it be said that they are completely identical.

The scientist accepts the subject-matter as the means to an end, to be used in identifying new problems and instituting new researches. His interests are, necessarily, self-confined.

The teacher's task is a different one. He is not immediately concerned with making new discoveries; with propounding new hypotheses, or verifying old ones. He is chiefly concerned with the task of applying his knowledge and experience in solving the student's everyday difficulties. Of paramount importance to him, is not the authenticity of the subject-matter to be presented, but how he may successfully incorporate it as part of the student's knowledge, to be employed, as occasion demands, in the practice of his chosen profession.

It is the failure to recognize this division of labour as between specialist and teacher, that has often resulted in the potential antagonism between the curriculum of studies and the actual learning-process through which students are directed.

Students of dentistry should not be expected to assimilate facts as they appeal to, and are usually presented by, specialists in the sciences. The material, to be properly assimilated, must be translated into terms commensurate with the students' progress in the subject, and in harmony with the recognized professional requirements.

In the Faculty of Dentistry of the University of Toronto, an earnest attempt is being made to find out, by trying and doing, not solely by theorizing and discussing, whether these problems relative to the teaching of physics, chemistry, and metallurgy may be worked out to a successful issue, and how.

In the University of Toronto a chair has been established in applied physics, chemistry, and metallurgy; and the curriculum has been so formulated as to permit the introduction of each subject in sequence according to the requirements of the other courses. The requirements for entrance to the Faculty of Dentistry include the matriculation standing with physics and

chemistry as obligatory subjects. The course extends over five years, during the first year of which, instruction in physics and inorganic chemistry is given by the regular teaching departments of the University. These departments also teach organic and biological chemistry.

In the second year, the students come under the direction of the department of applied physics, chemistry, and metallurgy when a course of ten lectures and thirty laboratory hours is given in mineralogy. The minerals selected for examination and determination are chiefly those from which dental metals and materials are obtained. In these exercises, some metals are recovered from the minerals; these are then discussed with respect to their properties and dental uses. The deleterious effects on metals, of included impurities derived from the mineral sources, are also stressed at this time. For instance, the possible inclusion of arsenic as an impurity of zinc oxide is pointed out during the examination of zinc minerals.

In this course the student becomes acquainted with the properties of plaster of Paris, through his tests of gypsum; he learns important details concerning dental porcelains when studying such minerals as kaolin, quartz, and feldspar; his first knowledge concerning dental cements comes through the handling of zinc minerals; the whole question of polishing and grinding opens up with the testing of corundum, emery, hematite, etc. The student also develops observation, visualization, and manipulative ability during this practical course.

Supplementing the work in mineralogy, there is a thirty-hour course in qualitative chemical analysis which provides an excellent opportunity for teaching many facts that are of dental value. The student learns the chemical properties of metals; why certain dental restorations prove unsatisfactory through discoloration or disintegration; why platinum deteriorates when carbonized or alloyed with low-fusing metals; how dental materials may be tested for purity, etc. As part of the course, a few dental cements, alloys, and dentifrices are analyzed, both qualitatively and quantitatively.

There is also given to the second-year students, a course of lectures on the occurrence, properties, and uses of minerals; the properties and structures of metals; methods of annealing, soldering, and polishing metals, etc. This course is introductory to the laboratory exercises in prosthetic and operative dentistry.

In the third year the course extends over forty-five lecture and one hundred and twenty laboratory hours. The lectures are given, for the most part, in conjunction with the laboratory course, and deal with such topics as the sources of supply, methods of reduction and purification; the properties are verified in the class exercises and experiments. Appropriate dental uses for each metal studied are discussed at this time, together with representative dental problems relative to the particular metal or material then being considered.

A few of the metals not commonly used in dentistry, but possessing possibilities in this regard, are also treated in the lecture course. Obviously, it is an advantage for a student to know something concerning such metals as molybdenum, tantalum, tungsten, and chromium, even though they are not usually listed as dental metals. Their inherent properties and the fact that they are constituents of important dental alloys, necessitates some consideration of them.

An opportunity is thus afforded for a discussion of the properties and dental applications of such alloys as stellite and stainless steel; also the possibilities, in dentistry, of platinum substitutes.

The study of aluminum and its compounds naturally leads up to a presentation of the derivation, preparation, and uses of abrasive materials, because so many of them contain aluminum compounds.

Reference is made to the exercises of the previous year in determinate mineralogy, when abrasive materials were studied, and samples of corundum, emery and tripoli are again made available for examination. The methods of manufacturing abrasive stones, disks, tape, paper, etc., are described in detail.

The position of aluminum in the electro-chemical series of the metals, also its chemical properties, are made the subject of many observations bearing upon the use of aluminum for dental restorations.

The technique for casting, swaging, annealing and polishing aluminum dentures forms the basis of practical exercises.

The question of soldering aluminum and of attaching vulcanite thereto are discussed rather fully and considerable information on the subject is obtained from the reports published by the Bureau of Standards.

Typical reactions involved in dental chair-side operations, or laboratory procedures, are explained in the lecture course

and practical exercises. Such problems as the precipitation, in a root-canal, of metals from solutions; the mixing and setting of plaster of Paris; the mixing and setting of dental cements; the preparation of dental porcelains; the composition of rubber; the composition and working properties of impression materials; ionization methods; changing the carat of gold alloys; electroplating processes; casting metals into moulds; fusing porcelain; manipulation of wax—these, and many other practical problems are included in the course. Methods of annealing, tempering, polishing and soldering metals are inquired into. When supervising these exercises, the instructor has a splendid opportunity for pointing out facts of practical dental importance; such as, the effect upon the temper of enamel chisels when placed in a flame; the danger of fracturing a cold forcep when under stress; the proper care of finely tempered broaches, clamps, etc.; methods of annealing foil gold; selection of soldering fluxes, etc.

Having this discussion of annealing and tempering of metals as a background, it is an easy transition to the discussion of the microscopic structure of metals, introducing such topics as the intergranular cement material; properties of ductility, malleability, toughness, brittleness, fatigue, etc.; the effect upon metals of simple stresses, such as those that result from burnishing and swaging.

Considerable time is spent in the study of typical dental cements, such as zinc cements, copper cements, silver cements, and the silicates. Constituents of some of the cements are prepared, including the oxychloride of zinc cement, the temporary cements, the oxyphosphate of zinc cement, and the oxyphosphate of copper cements. The silver and silicate cements are described in detail as regards preparation, properties and dental uses.

Samples of zinc oxide, prepared for use in these cements, are first tested for impurities, such as arsenic, chalk, etc.; emphasis being placed upon the disastrous results consequent upon using impure materials in dental cements.

A classification of all the cements used in dentistry is made and the correct methods of mixing them are demonstrated. Whenever it is deemed advisable, the chemistry of the mixing, hardening, etc., processes is given.

The cement samples prepared in these exercises are then tested for solubility in saliva and acid solutions. An approxi-

mate idea of the relative permanency of the cements is thus obtained.

The principles involved in alloy making are exemplified in the preparation of such alloys as brass, nickel-silver, aluminum-bronze, solders, fusible alloys, etc. While these alloys are being studied, the time is opportune for a discussion of such topics as eutectics, solid-solutions, cooling-curves; chemical, physical, and microscopic methods of examining alloys, etc.

The best methods of melting metals so as to obtain homogenous mixtures are explained. In this discussion, frequent references are made to the reports of the National Bureau of Standards on the physical properties of dental materials. The findings of this Bureau on the question of gold-platinum alloys are particularly interesting in that they refute the claim, sometimes made, that a homogenous gold-platinum alloy is practically impossible of attainment.

Amalgams are studied by having each student note the results obtained through mixing mercury with different metals. Some amalgamate readily; some with difficulty; others, not at all; some discolour; some generate heat; some set quickly, others slowly. The affinity of mercury and gold is easily demonstrated and a special caution is given against the contamination of gold restorations while inserting amalgam fillings. Methods of removing mercury from gold are also demonstrated.

Useful dental amalgams such as those of copper and silver are made and discussed during the course.

The samples of dental-amalgam alloys are amalgamated with varying proportions of mercury. Those of high silver-content are also compared with the samples of low-silver content, as regards the amount of mercury required for amalgamation, the setting-time, heat generation, etc. Correct methods of amalgamation and manipulation are also explained. Each student is required to analyze quantitatively several of the standard makes of dental amalgam alloys, because there is no method comparable to analysis for learning the proportion of constituents. The process does not consume very much time, provided it is done by a volumetric method. Having once standardized the solutions, it is simply a matter of easy titrations.

The technique of testing alloys by means of surface etching; applying stresses, etc., is outlined at the conclusion of the other exercises.

ORAL HEALTH for October, 1927

Considerable time is devoted to the refining processes, and the recovery of the precious metals. The process followed in the classroom is a combination of the fire-assay and wet methods, in which the processes of scorification and cupellation are introduced.

Because it is not always feasible for a dentist to follow out the complete process necessary to produce chemically pure metals, a shorter method for removing the brittleness of gold alloys is demonstrated.

From the metals recovered in these refining processes, solutions are sometimes prepared for use in electroplating. Students may, if they so desire, plate technique cases prepared in the prosthetic and crown and bridge departments.

This is a general outline of the course in the third year. It might, however, be advisable to give a more detailed account of the methods followed in the study of, say, two metals, copper and mercury.

When studying copper, the procedure is about as follows: Copper amalgam is prepared by at least three methods; then follows a discussion of its properties and uses; from the solutions of copper sulphate remaining from this exercise, black and red copper oxides are prepared. Discussion of their properties and uses in dental cements follows, during which extracts from the literature on the subject are introduced.

Alloys of copper, such as brass, German-silver, and aluminum bronze, are prepared, rolled out, and polished. These exercises again open up the whole question of alloying, a complete discussion of which is appropriate at this time. Methods of rolling, annealing, pickling, and polishing metals should also be demonstrated in connection with these exercises.

In the general summing-up of the dental uses for copper it is advisable to refer to such general subjects as the effect of copper solutions up on bacteria, symptoms of copper poisoning, ill-effects consequent upon the use of low-carat solders in dental restorations, etc.

Mercury is recovered from dental-amalgam scrap, and the most efficient methods of purification are indicated.

Samples of impure mercury are then tested by the students. They are required to detect and remove the impurities. Such an exercise serves to emphasize the properties of pure mercury and its relation to dental amalgams. Useful compounds of mercury, such as calomel, corrosive-sublimate, vermilion, etc.,

may be described during the chemical tests of mercury.

The presence of mercury compounds in dental vulcanizable rubbers is also shown experimentally; the relative amounts in different kinds of rubber are easily ascertained.

In the summing up of this metal such dental topics as salivation, mercurial stomatitis, symptoms of mercurial poisoning, mercurial idiosyncrasy, rubber sore-mouth, etc., should be introduced.

Class discussions respecting the relative merits of dental materials and their uses, should be encouraged, because they tend to develop the students' ability to marshal and arrange facts in a systematic manner. They also afford an opportunity for the teacher to estimate the students' knowledge of the subject.

Copies of journals, pamphlets, reports, etc., should be made easily available in the class-room so that they may be referred to by the students or teaching staff while the class exercises are being completed.

A list of readings is also given the students for synopsis. These readings are selected from authentic publications on the subject-matter of the course and function as a very important factor in the learning process.

In the fourth year, the time is mostly spent in the study of the strength of dental materials, together with other physical tests, such as the thermal conductivity of metals, cements, porcelains, vulcanite, etc. Microscopic sections of a few dental materials are also studied.

For testing materials under conditions of stress, there has been installed an Olsen-Boyd automatic cement tester of 2,000 lbs. capacity, equipped with specially designed attachments for holding large and small briquette samples, also with transverse and compression testing devices. This machine, besides being desirable for tension testing of dental cements, plasters, modelling stones, etc., is also suitable for making compression and transverse tests when these are indicated.

For heavier tests, there is an Olsen universal wire testing machine, with a capacity of about 4,000 lbs. This machine is also equipped for compression and transverse tests. With such an equipment it is possible to demonstrate some of the important physical properties of dental metals and materials under varying conditions of treatment. The correct techniques of mixing cements, plasters, modelling stones, investment mate-

rials, etc., are discerned as a direct outcome of these physical tests. Also, the student learns what conditions of vulcanization produce the strongest vulcanite; and what dental-amalgam alloys produce the strongest filling material when properly manipulated.

The relative compression and tension tests of dental cements and porcelains, show clearly their merits as filling materials and also serve to indicate the methods of manipulation calculated to produce best results.

Interesting data are obtainable by applying compression tests to same-sized test samples consisting of cast gold, foil gold, fused porcelain, cast porcelain, synthetic porcelain, cast aluminum, dental-amalgam alloy, copper amalgam, etc.

It will be readily observed that these testing machines, while sufficient for the purpose of making simple stress tests such as tension, compression and flexion, are not able to produce tests that are truly representative of conditions as we most frequently find them in dentistry. They are not completely representative of tests under service conditions.

Dental restorations do not always break down under the application of a single stress which even approximates the ultimate strength of the material. Repeated applications of a stress equal to only a fractional part of the ultimate strength of the material, are the usual cause of failure. In other words, repeated stresses or fatigue in the material causes its breakdown.

Realizing the need of some device for testing the strength of material under conditions of repeated stress, there has been installed a modified Olsen standard impact testing machine which makes possible tests of long duration. It is equipped with a recording drum for registering the test.

Dimensional changes in dental-amalgam alloys, dental cements, plasters, etc., are measured by means of micrometer microscopes.

The Harper testing apparatus is also used to demonstrate contraction in amalgam alloys.

A fundamental factor in dental educative processes is the interlacing of experimental and clinical evidence. Obviously, it is the task of the department of applied physics, chemistry, and metallurgy, to contribute generously to the experimental evidence.

Ontario Dental Association, Report of the Oral Hygiene Committee

ARTHUR W. ELLIS, D.D.S., CHAIRMAN.



It gives your Oral Hygiene Committee great pleasure to report for the year May, 1926, to May, 1927.

Your Committee regrets to report the loss of the services of Dr. Horace Eaton, who died in July, 1926. His work both as chairman and a member of this Committee, for a great number of years has been of inestimable value.

As the members of the Dental Profession are kept well informed, through the magazines, of the activities of the Committee and the Department of Health of Ontario, it is not necessary to set out in detail the many activities which have been successfully carried through. Reports have been received from various local committees and the progress in the advancement of mouth health and the prevention of dental disease is most gratifying.

In all work undertaken by the Department of Health, the interests of the local dentists have been safeguarded. No public dental health service has been undertaken which will in any way interfere with private practice. On the other hand, the dentists throughout the Province have shown themselves most altruistic in that they have given of their time and service gratuitously for the public good. As a matter of fact, this Committee has broadened out until nearly every dentist is a worker.

The Ontario Dental Health Day was the outstanding work of the year. As the activities of this day have already been reported in detail in the magazines, no further comment is needed.

Community Dental Health Service in Ontario is now organized with the closest co-operation between the members of the Dental Profession and the Ontario Department of Health along the following lines:

(1) The Department of Health to accept responsibility for the dental education of the public on the understanding that this will not interfere with other similar work; and that the Oral Hygiene Committee of the Ontario Dental Association,

be an advisory committee in all questions of dental education propaganda.

(2) Dental treatment in all its phases, including dental clinics, to be controlled by the dental profession of the province on the understanding that this will not relieve the Department of Public Health of the responsibility of assisting financially in the support of such clinics, the extent to which the department will extend financial assistance to be determined by future experience. It is of course understood that these arrangements must not in any way interfere with public dental services already established, unless by mutual consent of the parties interested.

The Provincial Secretary's Department has re-organized Dental Services in Government Institutions. Each institution has a staff dentist who devotes as much time as necessary to the work in that institution. In every case a local dentist is appointed. In three hospitals, that is, the Ontario Hospital, Whitby, Orillia and Hamilton, Dental Internes have been appointed. This new system of Dental Science is under the control of the Director of Dental Services of the Province, Dr. Conboy. Part of the time of the interne may be allowed for study and research and a year spent as such shall apply on the new Degree, that of Bachelor of Science of Dentistry, which has been established by the University of Toronto.

This is a wonderful step forward and the Department deserves to be congratulated on the establishment of such an efficient service.

The School Dental Services have been extended throughout the Province. Too much cannot be said in praise of the local dentists who have given their time for this work especially in making surveys. Marked improvement is shown in the dental condition of the public school children as a result of this work.

A clinic was held at the Canadian National Exhibition. The educational value of this has been very far reaching. It was visited by dentists and health workers from all parts of the world who have commented very favourably on the educational value of such a clinic.

In order to serve people in the unorganized districts who heretofore have not had the opportunity of dental services, an itinerant dental service is being inaugurated. One man has been appointed for this year and the Ontario Dept. of Health paying the salary, supplying equipment and supplies, and the

Red Cross are assisting in arranging for patients and paying travelling expenses.

This in itself is a great step forward that all people in the province might have the opportunity of Dental Service. Our plans for the future are:

(a) To extend and consolidate the educational work and services already established.

(b) To conduct a factory survey in one particular factory to find out definitely if possible the number of hours lost through dental disease.

(c) To have established dental services as a major service in all hospitals of Ontario. This has already been done in a few. We feel that no hospital is adequately equipped to do its work in relieving humanity of disease and pain which has not a Dental Department.

A meeting of representatives from the Board of Directors of the R.C.D.S., the Oral Hygiene Committee of the Ontario Dental Association and the Faculty of Dentistry, was held to discuss Public Dental Services.

There were present: Drs. McLean, Cowling, Mason, Reade, Ellis, Seccombe and Grant.

Dr. McLean was elected Chairman, and Dr. Grant, Secretary.

Dr. Conboy stated that the meeting was called to discuss Public Dental Services.

After discussing the question, it was decided:

1. That the Profession of Dentistry place itself on record as maintaining that dentistry should be made available to all classes of people and that dentists should be willing to give a reasonable amount of time gratuitously to provide treatment for those unable to secure it in the regular way.

2. That free public dental services should be provided only for those who cannot afford to pay dental fees.

3. When possible, the community dental service should take the form of a Hospital Department, but School and Factory Clinics may be needed in the larger centres.

4. Dental Departments in hospitals should be organized as an independent service and with the same standing as the other main departments.

That the Ontario Government through the Department of Health and the municipalities should give such per operation

grants as will enable the hospitals to finance a dental department.

Our publications, slides and other educational material have been well kept up and many additions made thereto.

The Committee wishes to leave the following message with the Association and trusts that in the future as in the past they will have the loyal support of all dentists.

The Ontario Dental Association is this year celebrating its Diamond Jubilee, sixty years of useful work. For the past 19 years they have had an Oral Hygiene Committee and the work has justified its existence. Dentistry is a great and noble profession, to which we should all be proud to belong. Your Oral Hygiene Committee has always tried to maintain its dignity and honor and, by this more extended service for the benefit of humanity, is striving to raise to a higher plane the ideals for which we serve.

Many outside of the Dental Profession are interested in this great work, for the prevention and correction of dental disease. Is it not fitting that at this sixty year period in our history and that of this great Dominion of Canada, we should all unite—Dentists, Laymen, Health Departments, Hospital Boards, and others, to carry forward to a greater extent this service, which will make for healthier and happier Canadians.

Bathtubs—and Open-Mindedness



WHEN, back in 1842, the first bathtub was installed in the home of a wealthy manufacturer in Cincinnati, the daily press was flooded with letters from irate health authorities.

These men said the shock of taking regular baths would be dangerous! The idea was criticized so severely that in one of our sovereign commonwealths the legislature, acting upon the tip given by those whom the public thought knew more about health than any layman, tried to stop this "devilish idea" by imposing a tax of \$30 on each bathtub installed.

Boston, following this lead, actually prohibited baths except after proper medical advice.

In Philadelphia an ordinance which would have made it illegal to take baths except after March and before November was defeated by only two votes!

PUBLIC EDUCATION

DENTAL HEALTH

"The public has decided it wants health talk and means to get it! The lay press is the most powerful medium of instruction for the public in health matters. We must do our best to secure its co-operation!"—Sir Thomas Horder.

IN this department each month will be published short articles suitable for use in the public press. The material has been authorized by the Oral Hygiene Committee of the Ontario Dental Association, and members of the profession may feel free to arrange for its publication in the local papers or magazines.

WEDGING OF FOOD.



YOU have suffered the annoying experience of having stringy foods wedge between your teeth; and you wonder what can be done to remedy it.

Normally, teeth should be tight together, with rounded contacts, as when two marbles touch; but through tooth decay or from teeth "drifting," this contact is lost.

The food then "jams" between the teeth and is held there until released—with what results?

Obviously, decay is liable to be incited in this area.

Also this impacted food material presses upon the soft underlying tissues, until they become irritated and inflamed. Thus injured, they lose their "tone," and fall an easy prey to the micro-organisms that cause disease.

Then follows the destruction of this wedge-shaped tissue between the teeth; a "pocket" is formed, which, becoming infected, results in the progressive destruction of the supporting structures of the teeth, which are then lost.

You see then, what grave damage can result from so simple a cause.

Now, the remedy! It is not the tooth-pick, which, through its indiscriminate use, may do further harm, and which at best provides but temporary relief.

But, where this "wedging" is first noticed, the insertion of a filling in one or both of the involved teeth, to restore the contact, will clear up the trouble.

This may even necessitate the removal of a faulty filling already in place, but far better this than to suffer the prolonged discomforts from "wedging food," with its train of grave consequences, should it go unchecked.

ACUTE ALVEOLAR ABSCESS.



HE once familiar and somewhat ludicrous picture of a man with his face widely swollen from a sore tooth, is now passing.

This wholesome change is due, in chief, to the spread of dental education among the public, and to the better methods of treating dental diseases at their inception.

But it cannot be said that its discomforts are less severe than formerly to those who, through neglect or ignorance, still suffer the torments of the acute alveolar abscess.

What, then, is the cause of this disease?

Alveolar abscess is subsequent to the death of the tooth pulp, and it is so named because it occurs within the bone which forms the alveolar process.

Following pulp destruction, the area surrounding the end or apex of the tooth root may become involved in inflammation, resulting from the poisonous products of pulp decomposition, incited by disease producing micro-organisms.

Depending upon the resistance of the individual or the severity of the disease process, the inflammation may stop here, or it may progress to the stage of pus formation with marked tissue swelling, and severe throbbing pain, when it becomes an acute alveolar abscess.

The pus soon penetrates the bone in an endeavour to find its way to the surface, and entering the soft tissues, proceeds to burrow through them, generally discharging on the surface in from one to three or four days.

Following this discharge, the swelling will gradually subside and the pain ceases.

With this disease the most prominent early symptom is likely to be soreness of the tooth, it being tender to touch, or bite upon.

In its severe type, it is almost always marked by a fever and may be accompanied by headache and general listlessness.

The danger of allowing this disease to run its course is that there may be marked tissue destruction, with the possibility of disfiguring scars about the face and neck. And being an acute infection, vigorous alleviating and curative measures should be at once instituted in its beginning, since grave consequences to health and life might follow where it is allowed to go unchecked.



FOR THE PEOPLE - BY THE STATE

This Department is Edited by

FRED J. CONBOY, D.D.S.,

Director of Dental Services, Province of Ontario.



A Travelling Dental Clinic in Ontario's Hinterland

UNDER the direction of the Director of Dental Services, Department of Health, Province of Ontario, a free dental clinic was opened this year, in the unorganized sections of Northern Ontario. Doctor W. J. Carson carried on this work most efficiently during the summer. The following summary of Dr. Carson's report will doubtless prove of unusual interest to the Dental Profession:

Treatment is given solely to patients who cannot afford dental care and also to those who cannot get a dentist: The work is carried on in Red Cross hospitals and in district schools, assisted by Red Cross nurses and Government nurses respectively. In the carrying on of their Public Health service the nurses know the conditions in each family and in that way no patient previously treated by a dentist or who can afford the services of one is treated. In most cases older people have had treatments and our work is chiefly with school children.

It is wonderful for these children that they can have this service. Through our experience this summer we found a child twelve years old being presented for the first time will have cavities in every molar and probably an extraction or two.

After an explanation the parents are made to understand why their children should have their teeth cared for and are loud in their praises for this new branch of the Public Health Department.

The best example of why this work is needed is that the greater percentage of patients presented this summer at the ages of eighteen to twenty had not a single molar left and were suffering terribly. These were patients who were never able

to secure dental care and these are the ones this service is trying to reach.

In all we treated 700 patients this summer and three-quarters of them were between the ages of five and sixteen; so you can understand what a help this service is going to be.

In no way can this work interfere with a dental practitioner in any community and we consider it a help to every dentist as well as a wonderful help to the country itself. A patient is examined and questioned and, if possible, sent to the nearest dentist. If impossible (for this) we do the necessary work.

* * *

EXTRACTS FROM A NURSE'S REPORT OF THE TRAVELLING DENTAL CLINIC.

THE clinic was carried on from July 20th to August 4th, 1927, in District 6 of the Province of Ontario. The work was done in the unorganized Townships of Henwood, Cane, Savard, Sharpe, Pacaud and Ingram, in the organized township of Dack, and in the town of Charlton. Most of this area was swept by the fire of 1922.

CO-OPERATION OF DENTISTS.

In the beginning of this work, the dentists practising near these places were visited. They were all interested and were



Some of the children served by the travelling clinic.

glad that something was to be done by the Department for these people. The names of the places where clinics might be held were submitted to the dentists and they agreed that they were good fields in which to hold clinics.

THE NURSE'S PART IN THIS WORK.

The nurse visited the majority of the schools in each section and selected the children needing treatment; she then conferred with the clerks in the organized sections and with the assessors and tax collectors in the unorganized sections to find out the financial standing of the parents and ascertain if they were worthy and deserving of this free treatment. The homes were then visited by the nurse and the parents questioned as to their knowledge of the condition of their children's teeth; almost every parent would answer, "I think they are all right, at least, I never hear them complain." The nurse would reply, "we don't want them when they complain, for in most instances when they complain, they are too far gone, and we can do nothing for them. Our object is to get them early, when there is no decay, or when it is just beginning."

"Have you ever had your child to a dentist for examination and treatment?" "No." "Why not?" "Money is scarce and we cannot afford to have this work done, my husband has had to buy some new machinery, or I have been ill, or with all these children to feed and clothe, we cannot afford to take them to a dentist." In some cases the children were only half fed and running about in rags. The nurse would then carefully inspect the teeth of all children. If any permanent or temporary teeth needed attention, they were urged to go to the Dental Clinic conducted by Dr. Carson. They were given a day, and an hour, and told where to go. So often the parent would say, "But, nurse, I can't dress them up." Her remark would be, "Send them clean, and in what they have." Some of the most needy cases did not come because of lack of clothes, and because of fear.

CENTRES.

In the unorganized townships the schools were used. In Dack and Charlton the Town Hall was the centre.

ASSISTANTS.

In every centre, a member of the Womans' Institute or a dependable girl assisted the dentist.

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TOTAL NUMBER EXAMINED AND TREATED.

Number examined	190
Number Adults examined	15
Number School Children examined	150
Number Pre-school Children examined	25
Number treated	169
Number Children with defects in permanent teeth	115
Number defects in deciduous teeth	22
Number of extractions	32
Number of silver fillings	136
Number of copper fillings	35
Number of pulp cappings	21
Number of cement fillings	7

FROM AN EDUCATIONAL STANDPOINT.

From this point this demonstration has been of great value. We find that the majority of children will not go to a dentist because of fear. They are nervous about it and they are afraid they will be hurt. The parents will not insist, so the child's teeth are allowed to go without the necessary care and treatment.

The clinic will show the parents the value of the care of both temporary and permanent teeth, and the relation between good teeth and a healthy physical condition.

After two or three years of this care, these children will be going to the local dentists, because they will be educated to the value of good teeth and a healthy mouth and will be working and able to pay.

* * *

DR. W. CARSON has just completed his three months' trip through the unorganized parts of the province and has given free dental treatment to a large number of people who would otherwise be deprived of this much-needed health service. In all the places visited, Dr. Carson was well received and the people appreciated the efforts of the Government to protect them from the pernicious results of dental disease. The Public Health and Red Cross nurses did valuable work in connection with the organization of the clinics by arranging to bring patients to the centres where the treatment was given. Without their faithful assistance the effort could not have been the pronounced success that it was.

The Profession of Dentistry, as represented by the men

practising in places adjacent to the clinic centres, again proved itself altruistic and public spirited. It must of necessity happen that in a work like this there is a possibility of interfering slightly with the interests of some practitioner, but every dentist concerned was most enthusiastic in the support of the work. So long as Dentistry is represented by men of this character we need have no fear of our professional standing. We can with just pride point to the men practicing amidst the hardships and difficulties of our hinterland as exhibiting the highest ideals of a noble calling.

The Ontario Department of Health is, however, very anxious not to interfere with the practices of resident dentists. We will not work for patients who can arrange to receive treatment through the regular channels. Our purpose is to relieve the profession of the burden of doing a large amount of work for people who cannot afford to pay a fee and to work for those who are so far removed from a dentist that treatment is impossible. It will take a little time to get our organization working smoothly, but ultimately we will have a service that will command the respect and confidence of all classes of citizens.

Our appropriation only permitted us to carry on three months' work. We have had most urgent requests from other places, but the work in these districts cannot be undertaken until next year. The stories of suffering sent in by our nurses are most pathetic and we hope that by next year we will be able to provide a fair measure of relief. While we recognize the great need, we must be careful not to allow our enthusiasm to run away with good judgment. Permanent progress will follow only when we have a policy so sane and practical that it has the sympathetic support of both the profession and the public.

Some dentists have wondered why the Government does not arrange with the men already in the field to do this work and pay them a set fee per operation. Such a method has received the careful consideration of the Department and a number of requests for it have come from dentists who are working in the outlying districts. From a Government standpoint, the plan is not feasible and, for the time being, we must rely upon the travelling dentist. The Department will welcome suggestions which will tend to improve the service.



British Columbia—W. J. BRUCE, D.D.S., 404 Birks Bldg., Vancouver.

Alberta—JOHN W. CLAY, D.D.S., 914 Herald Bldg., Calgary.

Saskatchewan — C. W. PARKER, D.D.S., Imperial Bank Bldg., Regina.

Manitoba—W. W. WRIGHT, D.D.S., 767 Warsaw Ave., Winnipeg.

Maritime Provinces—J. STANLEY BAGNALL, D.D.S., 34 Larch Street, Halifax, N.S.

Ontario—LIEUT.-COL. W. G. THOMPSON, 46 Sun Life Bldg., Hamilton.

STANLEY G. McCAUGHEY, D.D.S., 384 McLaren St., Ottawa.

Quebec—M. L. DONIGAN, D.D.S., 127 Stanley St., Montreal.

PAUL GEOFFRION, D.D.S., 308 Sherbrooke Street, Montreal.

Provincial Editors will appreciate receiving from all local societies copies of papers, society proceedings or personal notes, for publication.



MARITIME PROVINCE NOTES.

THE annual business meeting of the Halifax Dental Society was held on the 4th of October. Plans were discussed for the winter programme and reports of last year's activities read. The Chairman of the Oral Hygiene Committee spoke of the work done in the past year by the Provincial Government in preparing pamphlets on the care of the teeth. The need for the appointment of a Provincial Dental Health Officer was stressed.

The following were elected for the ensuing year:

President—Dr. F. W. Johnson.

Vice-President—Dr. W. G. Dawson.

Secretary-Treasurer—Dr. G. A. Chudleigh.

Complete Executive—Dr. F. W. Stevens and Dr. J. Stanley Bagnall.



THE Annual Meeting of the P. E. Island Dental Society was held on the 26th of September. The meeting was a business one and a number of important matters were taken up. The Society voted in favour of the scheme for the reorganization of the Canadian Dental Association.

The following officers were elected:

President—Dr. T. E. E. Robins, Charlottetown.
Vice-President—Dr. J. A. McMurdo, Summerside.
Sec.-Treas.-Registrar—Dr. J. S. Bagnall, Charlottetown.

Complete Council—Drs. Blanchard and Smallwood.

A special meeting of the Society was called in August to meet Dr. Harry S. Thomson and discuss the problem of oral hygiene. The meeting was one of the best ever held by the Society and two-thirds of the total membership were in attendance.

—J.S.B.

* * *

QUEBEC

MONTREAL DENTAL CLUB.



HE preparations for the Montreal Fall Clinic are rapidly nearing completion, and the great interest shown by enquiries indicates that it will be the most successful held yet.

The Clinic is being held this year on November 3rd, 4th and 5th, in the Mount Royal Hotel. Prosthodontia, Root Canal Therapy, Crown and Bridge, and Dental Radiography will be represented by the following clinicians:—Dr. W. H. Wright, of Pittsburgh, "Full Denture Construction, Using an Adaptable Articulator"; Dr. Alfred Walker, of New York, "Therapeutics of the Pulpless Tooth"; Dr. L. W. Doxtater, of New York, "The Relation of Balancing the Occlusion to the Other Steps in the Construction of Removable Bridge-

CLINICIANS—MONTREAL FALL CLINIC



Dr. L. W.
Doxtater,
New York City

Dr. Alfred
Walker,
New York City

Dr. W. H.
Wright,
Pittsburgh

Dr. Howard
Jackson,
Detroit

ORAL HEALTH for October, 1927

work, Showing the use of the Spring-Bar, Split-Bar, Peeso Split Pin and Tube and Wrought Gold Clasps"; Dr. Howard Jackson, of Detroit, "Radiographic Interpretation". Exhibits and moving picture films will have their place, and last but not least, the social activities are planned to make it pleasant for all.

Applications with cheque for Twenty Dollars (\$20.00) will be accepted only from a limited number, and in the order in which they are received by the Secretary. (Dr. A. D. Crowe, 416 Mackay Street, Montreal.)

* * *

The Fall Golf Tournament took place on September 13th, when some thirty-five members journeyed out to the Country Club to match their skill. After the smoke of battle had cleared, and casualties reported, it was found that Dr. J. S. Dohan was the winner of the Club's Open Championship, and Dr. Ross Cleveland the winner of the Handicap Match.

—M. L. D.

* * *

ONTARIO.

OTTAWA DENTAL SOCIETY.



HE Ottawa Dental Society held its first meeting of the season at the Rivermead Golf Club on October the eighth, 1927.

The Executive Committee, recognizing that the present position of Dentistry is one of such rapid progress that it takes every effort to keep up with the profession, decided that certain social and cultural holidays were necessary to ease the professional pressure.

The result of this thought was that this function was a Dinner-Dance-Bridge Party at which "Shop" was strictly taboo.

After a recherche repast, served in the Rivermead's best style the first item was the presentation of an illuminated address and a gold-mounted cane to Dr. S. S. Davidson in recognition of his long and efficient services to the profession in various official capacities.

Doctor Davidson was taken completely by surprise, but rose to the occasion with his customary ready wit, fully justifying his popularity among his confreres.

Another surprise was the advent of the Ottawa Dental Society Glee Club, a double quartette, which, under the leader-

ship of Dr. Archie Grace, rendered many fine numbers. Dr. P. L. Nesbitt as vocal soloist also achieved distinction.

There were dinner prizes, which caused much merriment, dance prizes and bridge prizes, all adding to the gaiety of the occasion. By a standing vote it was decided unanimously to make this an annual affair. The President, Dr. Lorne MacLachlan, occupied the chair.

M.G.McE.

* * *

TORONTO ACADEMY OF DENTISTRY.



THE opening session for the year took the form of a supper meeting at the Prince George Hotel, with the President, Dr. Sidney Woollatt, in the chair. The speaker of the evening was His Honor, Judge Mott, who described in a most entertaining and illuminating way the work of the Toronto Juvenile Court. Magistrate Jones was present, as was also Dr. McConnell in his official capacity as President of the Toronto Academy of Medicine. A group of Dentists from Hamilton, headed by Lt.-Col. Thompson, were among those from out of the city who attended the meeting.

* * *

The following resolution was passed by the Oral Hygiene Committee:—

1—That indigent people of the city should receive free necessary dental service.

2—That all Hospitals which are under the authorization of the Hospitals Commission to receive Civic and Municipal grants, should be the place for these Clinics.

3—That the Dental profession of the City of Toronto should act in an advisory capacity, working in conjunction with those who are paying for the services. Besides paid full time men, the profession should volunteer their services gratis, to man the Clinics.

* * *

ALBERTA.



THE Edmonton Dental Society held its first session of the year on October 4th, 1927, at the Macdonald Hotel. Dr. Morton Hall, Pathologist at the Royal Alexandra Hospital, presented an informative paper on pathology as it relates to the practice of Dentistry.

—J.W.C.

Obituary

DOCTOR G. M. HERMISTON.



WE regret to announce the death this month of Dr. G. M. Hermiston, of Toronto, in Johns Hopkins Hospital, Baltimore, Md., where he was undergoing treatment. He and Mrs. Hermiston had been in Florida for some months, where the Doctor was convalescing following a serious operation that had been performed some months ago.

Dr. Hermiston was one of the most prominent figures in Fraternal Society work in the Province of Ontario. He was born in Warkworth, Ont., and attended Lindsay High School, later obtaining the degree of Bachelor of Arts in Queen's University, and the degree of Doctor of Dental Surgery at the University of Toronto. He was married in 1900, to Helen Waite of Picton.

At a recent meeting of the Executive of the Faculty of Dentistry of the University of Toronto a resolution was adopted expressing deep sympathy with the members of the family in their bereavement and the sense of loss in the death of one who was from 1906 to 1917 an honored member of the Faculty.

Dental Clinic at the Canadian National Exhibition



THE Dental Exhibit at the C.N.E. this year took the form of a teaching clinic. By means of motion pictures, still pictures, films, models and a huge display book, the programme for the prevention of dental disease was presented to the people. The exhibit was housed in the south wing of the new Government building and many visiting dentists registered and spent a short time with Dr. Conboy, the Director of Dental Services, whose office was immediately adjoining the Clinic.

Oral Health



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EDITORIAL

Canadian Universities and Dental Standards



WE believe that Canadian universities have an important national service to render in the fostering of a better understanding among the provinces of Canada and the development of Canadian patriotism and unity. College graduates as individuals and all of the professions as organized groups have a special national duty to perform. Dentists in Canada have found it exceedingly difficult to maintain a strong, rugged, national dental organization, and one of the chief difficulties (aside from the geographical problem) has been the varying preliminary and professional standards, not only among the Provincial dental bodies themselves, but also among the universities of the Dominion.

Primarily, universities are not concerned with dental licensure, but they are primarily concerned with standards of dental

entrance and education. And it is by the universities that the next step toward uniformity in dental standards should be taken. Unification of dental standards in Canada at this time would have great national significance. Uniformity need not mean deal-level sameness. Surely there is room in this young country for the development of individuality in education.

The writer had the privilege, a few months ago, of conferring with the universities, the larger dental societies and representatives of licensing boards, of the provinces of British Columbia, Alberta, Saskatchewan and Manitoba, and found everywhere a disposition to recognize dentistry as a branch of health service and to require the same pre-professional training as obtains in medicine.

At the annual conference of Canadian universities held in London express approval was given of the one-five and its equivalent, the two-four plan, as a minimum standard for graduation in Dentistry, and which has already been adopted by the State of New York, Harvard University, Tufts, and a number of the Canadian universities.

In adopting a generally uniform standard as a principle, it is important in drawing up regulations to recognize the varying conditions existing in other provinces that equivalency may be considered without demanding absolute similarity.

The action taken by the Universities' conference, looking toward the unification of dental standards in Canada is of great value to the dental profession in its endeavour to unify and strengthen dental organizations throughout the Dominion. Such action was a peculiarly fitting contribution during this Diamond Jubilee Year because of the circumstance that the first dental society in Canada was organized sixty years ago in the town of Cobourg in the same month and year as Canadian Confederation.

American Association of Dental Schools



THE fifth annual meeting of the American Association of Dental Schools will be held at the Mayflower, Washington, D.C., March 26th, 27th, and 28th, 1928.

DELOS L. HILL, *Secretary, A.A.D.S.,*
1206 Medical Arts Building,
Atlanta, Ga.

*“ All who Joy would win,
Must share it—
Happiness was born a twin.”*



FRANK G. CONKLIN, D.D.S.,
President, Chicago Dental Society.

ORAL HEALTH

*A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION" AS WELL AS THE POUND OF CURE*



Vol. 17 TORONTO, NOVEMBER, 1927 No. 11

An Open Letter and an Invitation

*To the Ethical Members of the Dental Profession of
Canada:—*



THE Chicago Dental Society sends its most cordial greetings and an invitation to be our guests at our sixty-fourth annual mid-winter Meeting and Clinic to be held at the Drake Hotel, Chicago, on January 24th, 25th, and 26th, 1928.

Dr. Arthur D. Black, Dean of the Northwestern University Dental School, Chicago, Chairman of our Programme Committee, is preparing a programme which we believe will be of practical benefit to every member in attendance and which will contain the names of the best talent in the profession.

In the past, our meetings have always been graced by the attendance of many of the leaders of the profession of Canada, but we would feel highly honoured to have that number increase many fold.

Plan to be with us. Bring your membership card in your local organization and make reservations early as we are looking forward to a registration of approximately eight thousand.

Railroad rates will be available.

With all best wishes,

Fraternally yours,

FRANK G. CONKLIN.

President, Chicago Dental Society.

Chicago, November 1st, 1927.

Dental Diagnosis*

By A. D. A. MASON, D.D.S., TORONTO.



THE most tiring part of the diagnostician's day, or that which saps the energy of the operator in the course of a busy day, is the deciding of what should be done in the various cases which come under his observation. It is the making of a diagnosis that sends the practitioner home at night with nerves ragged and on edge, and his usual placid and contented disposition soured and chilled.

Whether it affects a huge business deal involving thousands, or resolves itself down to the extraction of an individual tooth, it requires the same clear thought that must lead to a definite decision, the same final observation that peers into the future, the same certainty and celerity with which he must adapt himself to the complexities of the moment.

What is diagnosis?—the placing of values on great trifles, taking as your foundation the consideration of small details, and building up from this groundwork of minor things a history and an analysis that is clear, concise and definite.

The dental diagnostician of the past in making a diagnosis has kept his mind and his energies centred too much on the actual cavity or tooth directly involved, and has not been sufficiently concerned in the broader field of observation—the systemic condition of the patient, or even of the surrounding parts.

The physician has, however, on the other hand, made his diagnosis from a consideration of general systemic conditions, and consequently has ignored the local symptoms; therefore, it is quite clear, in diagnosis and consultation, the medical and dental practitioners are not on common grounds.

It is always wise to avoid passing fads and fancies; too many men nowadays will drift with the tide, and be carried away by some popular idea of the moment, and in consequence, will naturally force all their diagnosis cases into that particular channel.

Specialists in Dentistry—in Exodontia, X-ray, Orthodontia and Periodontia—are therefore inclined to place a case in their own particular group, and for that specific reason I wish

*Resumé of Address before the Ottawa Dental Society, October, 1927.

for greater co-ordination and co-operation between the general practitioners and the specialists.

The general practitioner usually has a greater knowledge of the conditions, as the patient will invariably reveal more to him than to a specialist.

What does the patient expect from the general practitioner? He desires a diagnosis of his condition which will prevent more serious ailments at a later date. For example a child of twelve, with an extreme overbite, should be told what will happen to the mouth at the age of forty-five. In other words, he should be told that if the traumatic condition is allowed to proceed from the age of twelve, we know that this patient will be treated for periclasia at forty.

As focal infection is playing such an important part at the present time, it is vitally essential that the dentist should foresee such possible conditions, and insist upon periodical examinations of the mouth, and see that repairs to carious teeth are carried out before the cavities have developed to any extent, as this is most obviously the easiest way to prevent focal infection. It is therefore most essential that strict attention should be paid to small cavities and that they should be filled immediately.

The patient, most assuredly, has certain claims upon the dentist; he demands an unhurried and unworried mind, a mind not concerned with his own individual cares and perplexities, but free to make a clear diagnosis. Therefore, considerable time and thought must be expended to produce results worth while, and this of course necessitates a fee worthy of the effort.

History must always be taken into consideration. Hereditary diseases such as Tuberculosis, Syphilis, weak resistances, or any of the other systemic complaints, must be noted, as these will always influence us in our treatment.

History of contracted diseases such as Neuritis, Arthritis, and Anaemia, always have a direct bearing on the prognosis of a case. The age of the patient also is very important; similar conditions in children, adults and people of old age will be treated entirely differently.

Habits, diet, and metabolism of the patient always have a profound and direct bearing on the treatment, and must therefore be taken into consideration when making a diagnosis. Also certain physiological conditions of the patient have a

general bearing on our reaching a diagnosis; such as pregnancy, change of life, or advanced age either in the male or female.

In addition to the above, local conditions must not be overlooked, mucous tissues, muscular tissues of the mouth, tongue, cheek and lips, tonsils and throat (not with the idea of treating for tonsils), but they all have a clearly defined and definite part to play in the making of our diagnosis. Now we pay attention to the enamel, dentine, pericemental membrane, and have reached the local symptoms which seem always to be overlooked by the physician.

The apical areas of the roots must be examined by means of x-ray, transillumination, and the testing of the pulp for vitality both by thermal and electric tests.

The greatest help in this local examination is possibly an abundance of light, and this should be obtained by using in our offices the daylight bulbs, which give us the daylight ray. Headlights, which throw the ray directly into the field of observation, and mouth lamps which will illuminate all parts which we require to examine, are always used to advantage.

Magnifying glasses are very beneficial, as they increase the field of vision, making it possible to see minor details which are hidden from the naked eye.

A Few Interesting Dental Cases

W. A. CRICH, D.D.S., TORONTO.



FIGURE I. shows three dental x-rays which were taken from a full mouth radiogram of a patient recently seen at the Clinic. Patient gave a history of having had all her lower teeth removed a few weeks previously, and was contemplating having partial upper and full lower dentures made. On account of the patient's condition, it was thought advisable to carefully check up the mouth for any possible hidden foci. In this particular case, some surprise was experienced on finding three unerupted third molars, an unerupted supernumerary tooth in the upper left third molar area, as well as both roots of the lower right second molar.

This case emphasizes the necessity of careful dental x-ray examination of the teeth, and also the value of post-operative x-rays before making extensive dental restoration.

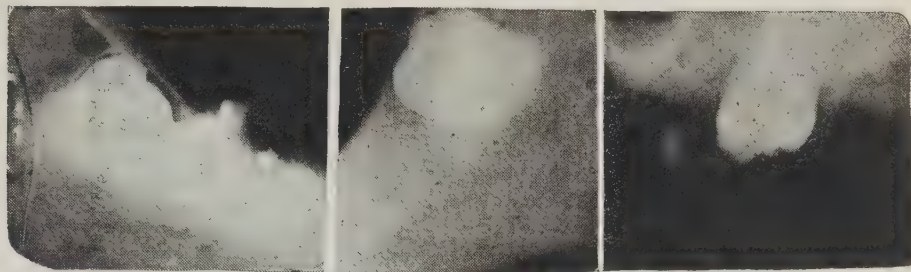


Fig. I.

FIGURE II. shows two x-rays which were taken of an area at different angles. In the radiogram on the right, the x-rays were focused on the cuspid, while in the other they were focused so as to pass between the bicuspid. From the former, one would be led to think that a short post had been placed in the pulp-chamber of the first bicuspid in order to secure retention of the filling restoring the crown of same. In the other film, though, the small post is seen to be in the dentine.

This case shows the necessity of having the patient present at the time of making the diagnosis, so that the history of the questionable tooth may be solicited and the vitality of the tooth tested.

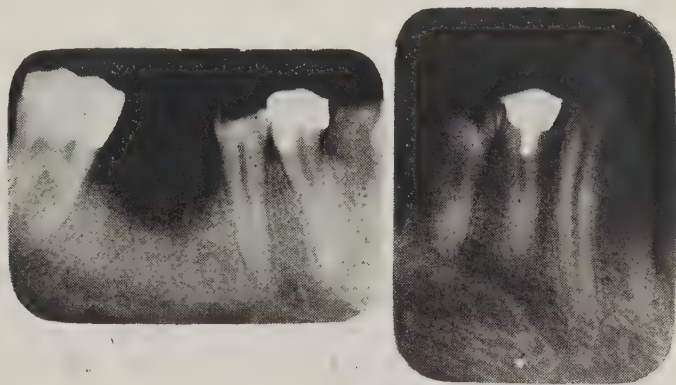


Fig. II.

In FIGURE III. are seen two roentgenograms, taken in the mouth of a young lady patient, showing four molars on the lower left side. The fourth molar is seen to be small, well developed, unerupted and with its apices not entirely closed.

FIGURE IV. shows an unusual condition. In the upper, two unerupted molars are to be seen, whilst in the lower none of the molars have completely erupted. Only the mesial portion of the lower first molar could be seen in the mouth, and through this opening an amalgam filling had been placed in its

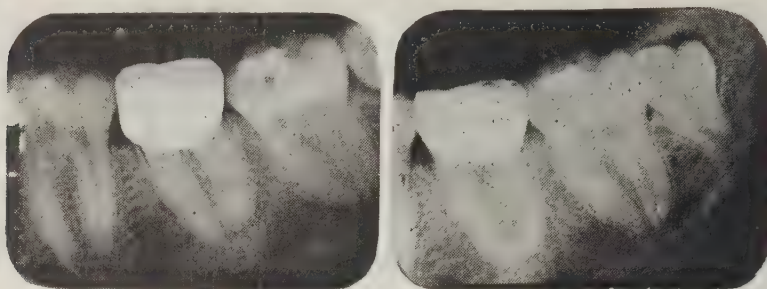


Fig. III.

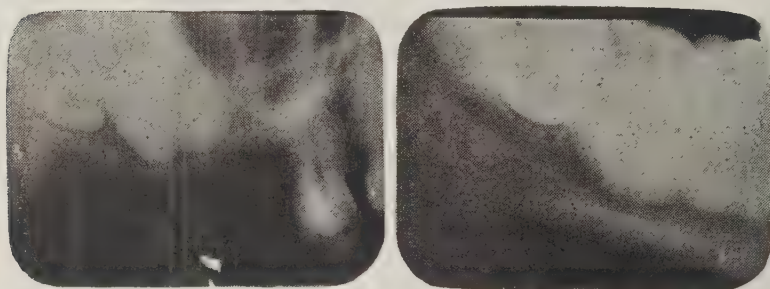
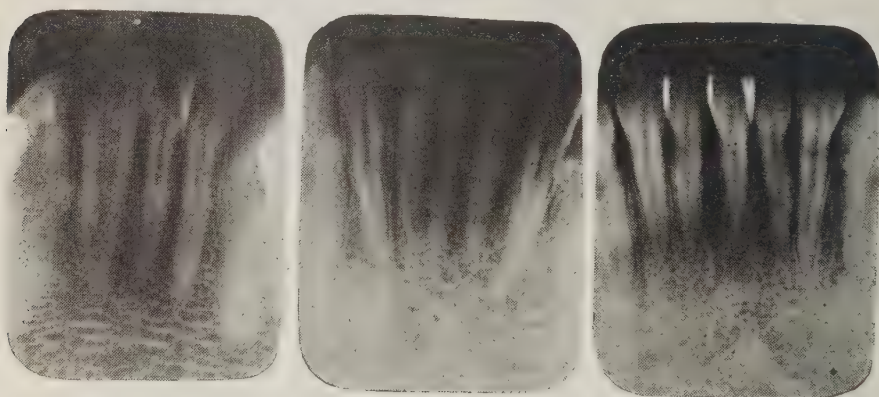


Fig. IV.

occlusal surface. The lower second and third molars were impacted.

From the patient's history, it was not thought that these were causing any irritation, so that removal of these teeth was not insisted upon.



(a)

(b)

(c)

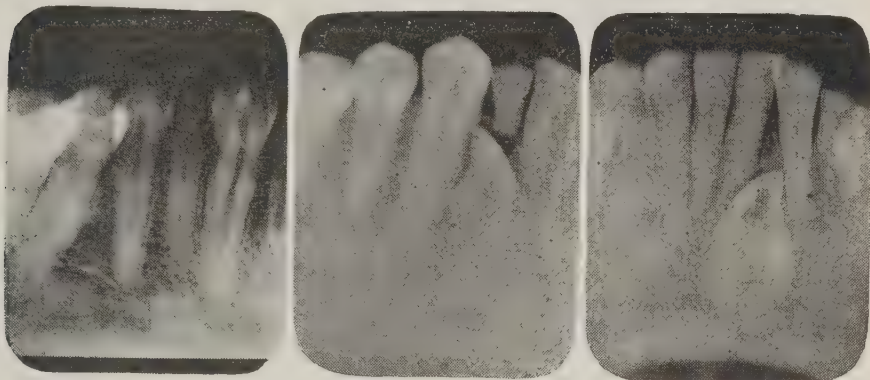
Fig. V.

FIGURE V.—(a) Roentgenogram shows a lower central and lateral incisor which are completely fused.

(b) Roentgenogram shows three central incisors, two of which are partially fused.

(c) Roentgenogram shows five well developed lower incisors.

FIGURE VI.—(a) Roentgenogram shows transposition of lower lateral incisor. (Lateral incisor is to be seen between lower cuspid and first bicuspid.)



(a)

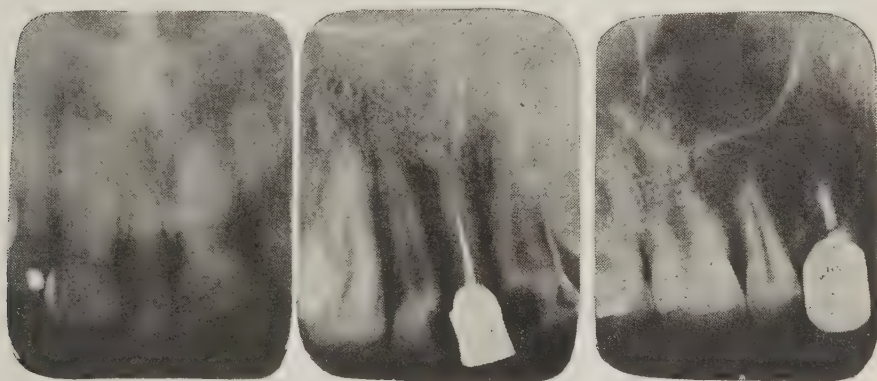
(b)

(c)

Fig. VI.

(b) Roentgenogram shows an unerupted lateral incisor, with deciduous lateral incisor still in position.

(c) Roentgenogram shows an unerupted lower cuspid. In this case the deciduous cuspid was still in position. (Impacted tooth between the two upper central incisors.)



(a)

(b)

(c)

Fig. VII.

FIGURE VII.—(a) Roentgenogram shows a supernumerary tooth between the two upper central incisors.

(b) Roentgenogram shows an extra upper cuspid, both of which appear to be well formed.

(c) Roentgenogram shows an upper first premolar still in position. There is no evidence of any permanent first bicuspid. The deciduous tooth shows no absorption of its roots, has been treated, and carries a gold crown.

The Use of Plaster of Paris as an Impression Material*

BY W. H. SODEAU, D.Sc., F.I.C., F. INST.P.,
M.I.CHEM.E.

AND

PROFESSOR C. S. GIBSON, O.B.E., M.A., M.Sc., F.I.C.



SOME ten specimens of commercial dental plaster have been studied in detail with special reference to impression making.

The expansion occurring when these plasters were mixed with water and with solutions of various accelerators and retarders has been measured by means of a simple form of extensometer using a .01 mm. dial gauge in conjunction with a 100 mm. test piece. The influence of such substances upon the setting time has been determined with the aid of the Vicat needle instrument, commonly employed in cement testing, and the course of hydration studied by means of thermometric observations. The development of the tensile strength of plaster briquettes has been traced, using a normal cement testing machine.

The paper includes various tables, graphs, etc., and a description of a method of taking impressions practically free from expansion which has been adopted in the Dental Department of Guy's Hospital.

The following "conclusions" are taken *verbatim* from the original paper:—

(1) Plaster of Paris is a complex and variable mixture, the nature of which is somewhat imperfectly known, in spite of a voluminous literature.

It is manufactured by heating gypsum so as to drive off the greater part of the water. The process of setting may be regarded as the reversal of this.

Dental plaster consists mainly of calcium sulphate hemihydrate, $\text{CaSO}_4, \frac{1}{2} \text{H}_2\text{O}$, but contains various forms of anhydrite, CaSO_4 , in addition to the di-hydrate or gypsum.

(2) The final setting time, as determined by the Vicat apparatus, corresponds closely with the time of the removal of

*Abstract of a paper communicated at the Annual Meeting of the British Dental Association, by courtesy of the Dental Record.

the impression from the patient's mouth, and usually lies between one quarter and one-third of the duration of the period of active hydration as determined by thermometric observations.

(3) Plaster fresh from the calciner, in an unduly active condition, can be readily modified or matured by exposure to moist air.

(4) The dental plasters examined give a linear expansion of about 0.3 per cent. when mixed with water in the proportion of 100 grm. to 60 c.c. without prolonged stirring, but this is greatly increased if stirring is continued after the mixture has appreciably stiffened, and in extreme cases may approach 1 per cent. Addition of gypsum (previously hydrated plaster) produces effects similar to those of prolonged stirring, accelerating the setting and augmenting the expansion.

(5) Expansion during the hardening of the plaster not only alters the scale of the impression, but may also produce marked distortion.

(6) The above-mentioned expansion can be reduced to a negligible amount by the use of a potassium salt as the accelerator, an alkaline substance being employed if necessary to prevent excessively rapid setting. Under these conditions prolonged stirring does not give increased expansion, nor is the setting time greatly affected thereby.

(7) Efficient anti-expansion accelerators can be made with either the sulphate, chloride or nitrate of potassium, using borax as controlling retarder. Potassium tartrate or Rochelle salt (KNa tartrate) can be used without a retarder in the case of slow-setting plaster.

(8) Borax, sodium carbonate, sodium bicarbonate and potassium carbonate have given good results as retarders in conjunction with potassium sulphate, but borax is preferred.

(9) Neither sodium sulphate nor ammonium sulphate is an efficient substitute for potassium sulphate.

(10) Alum apparently owes its power of acceleration and moderate reduction of expansion to its potassium sulphate content, aluminium sulphate being relatively inert.

(11) Sodium chloride (common salt) is inferior to alum, as it does not reduce expansion unless used as very strong solution, e.g., 25 per cent., which retards the setting and gives a very friable mass covered with crystals.

(12) Rochelle salt gave a reduction of expansion corresponding to its potassium tartrate content, but the present work

has not confirmed the exceedingly small expansions recorded by Simms when using this substance. Its accelerating power, in the concentrations tried, was much less than would be expected from the results with the tartrates of sodium and potassium used separately, and insufficient for use with slow-setting dental plasters. It is greatly affected by the addition of borax, relatively small quantities of which cause great retardation and may even inhibit the hydration for some hours.

(13) Sodium tartrate, contrary to Simms' results, gave but little reduction of expansion.

(14) Potassium tartrate is more effective than Rochelle salt, but appears to have no advantage over potassium sulphate, which is cheaper and not liable to develop moulds.

(15) All the above accelerators effect a great reduction in that portion of the expansion which takes place after the cessation of active hydration, i.e., after a period usually less than half an hour.

(16) It is convenient to add to the accelerating solution an appropriate dyestuff, preferably one forming an insoluble lake with calcium salts. Of those tried alizarin S. (sodium alizarin sulphonate) gave the best results.

(17) The recommended anti-expansion accelerator solutions are made up with 4 per cent. potassium sulphate, 0.04 per cent. alizarin S., and amounts of borax varying between 0.4 and 1 per cent., adjusted to give a convenient setting time with the particular plaster employed.

With these solutions the linear expansion is reduced to the order of 0.06 per cent. Prolonged stirring usually tends to diminish rather than augment this.

The residual expansion appears to be greatest in those plasters which are relatively rich in slowly hydrating constituents. It was not markedly affected by the prevention of surface evaporation, nor by the addition of previously hydrated plaster or of soluble anhydrate.

(18) Such solutions used with simple measuring devices form the basis of an improved technique facilitating the uniform production of impressions free from appreciable expansion and appropriately coloured. Over a thousand impressions have been taken by this method, and it has been found to work well in the hands of students.

(19) It is desirable that dental plaster should be matured to a definite standard by all vendors. At present it is necessary

to ascertain by trial the proportion of borax required, and in extreme cases to expose the plaster to moist air before use.

(20) Normal briquettes (section 1 in. square at the centre), made up with plaster and water in the proportion of 100:60, develop a tensile strength of about 200 lb. per square in. during the period of active hydration (usually about half an hour).

Retention of uncombined water by covering the briquette practically prevents further increase of tensile strength, and may even cause a decrease, but the strength of an exposed briquette increases greatly as drying proceeds.

A briquette freely exposed to air at 20° C. loses more than half the excess water during the first twenty-four hours, and practically the whole in two to three days, after which period no further increase of tensile strength appears to take place and the composition approximates to that of gypsum.

(21) Accelerators when added in considerable quantity produce in general a lowering of tensile strength, but, within reasonable limits, this is not a disadvantage in the case of impressions.

With a potassium sulphate and borax solution a slight increase of strength takes place after the end of the period of active hydration (which period is usually about a quarter of an hour) even if the briquette is covered, but this is followed by a decrease which is very marked when evaporation is prevented. An exposed briquette is markedly weaker at the end of twenty-four hours, although more than half the excess water has then evaporated, but may double its strength by the end of the second day, when nearly dry. A thinner layer as ordinarily employed for impressions would naturally dry more quickly.

With a 2 per cent. solution of common salt the results were similar, but drying proceeded more slowly, and the recovery of tensile strength took place somewhat later.

With 4 per cent. alum solution both drying and recovery of strength were still more delayed. In all cases the proportion of water ultimately retained approximated to that required for the dihydrate (gypsum).

It should be understood that the above conclusions are limited to the type of plaster actually examined, viz., those employed for dental work, and do not necessarily apply to other forms of plaster.

This research was undertaken on behalf of the Dental Investigation Committee of the Department of Scientific and Industrial Research, the necessary funds being provided by the Dental Board of the United Kingdom. It is being continued with special reference to the making of models with various materials.

Operative Outline Prepared for Dental Students in University of Iowa

*Suggested Plan of Directing Student in Cavity Preparation
Instrumentation During the Initial Stages of
Operative Clinical Practice.*

BLACK'S STEPS IN CAVITY PREPARATION.

1. Examine occlusion.
2. Obtain required outline form.
3. Obtain required resistance form.
4. Obtain required retention form.
5. Obtain required convenience form.
6. Remove any remaining carious dentine.
7. Finish walls and margins.
8. Make the toilet of the cavity.

EXCAVATION OF TOOTH CAVITIES—THE PROCEDURE OF INSTRUMENTATION.

General Suggestions.

Work by direct vision wherever possible.

Use a straight hand-piece wherever possible.

Keep in mind that carious dentine is hypersensitive and that heat is generated by rapid and continuous cutting or grinding of tooth structure with engine bur or stone.

Frequently sharpen long handle cutting instruments on oil stone during each operation.

Hand pieces and engine parts should be oiled frequently and sparingly.

Apply rubber dam when required.

Obtain separation where required.

This outline does not include all of the details required in the excavation and preparation of tooth cavities for place-

ment of filling materials. It is to be used primarily as an aid in following a systematic method of instrumentation for excavation and preparation of carious tooth cavities for the placement of gold foil filling.

As a *general* procedure this method applies equally as well to cavity preparation for amalgam and cement fillings and inlay restorations, with the following variations:

PREPARATION FOR AMALGAM AND CEMENT.

There is no bevel of cavo-surface angle, but a slight flare or outward inclination of enamel walls; the enamel margin is a smooth and well defined angle.

INLAY PREPARATIONS.

In the majority of cavity preparations for inlays, the outline and resistance form is the retention form; occasionally pin or post retention is indicated. There are no convenience or retention angles. Cavity walls are at right or obtuse angles from axial, gingival, or pulpal walls. The depth of occlusal portion of cavity is generally less than for gold foil. Bevel cavo-surface angle on all occlusal and gingival margins. Do not bevel cavo-surface angle on buccal, labial, or lingual margins of proximal portion.

OCCLUSAL CAVITIES.

I. 1. The method of gaining access to carious dentine depends upon the extent of enamel involved. Use small or large round burs and spoon excavators as indicated.

2. Extend cavity by undermining enamel with small inverted cone bur.

3. Remove undermined enamel in upper molar cavities with non-angle chisels or Wedelstaedt chisels, in upper bicuspid with Wedelstaedt chisels, and in lower bicuspid and molars with enamel hatchets.

4. Repeat Nos. 2 and 3 until desired outline form is obtained.

5. Obtain resistance form of flat pulpal wall and peripheral walls at right angles to pulpal wall with mounted Miller points or fissure burs.

6. Place retention angles with small inverted cone bur and smooth with small chisel.

7. Remove remaining carious dentine with spoon excavators.

8. Smooth peripheral walls with chisels and pulpal wall with hoes.

9. Bevel cavo-surface angle with Wedelstaedt chisels.

10. Cleanse cavity with small pellet of cotton and warm water, dry, and remove any debris with chip blower.

The instrumentation for Classes II., III., IV., and V. are outlined in a similar manner.

The procedure as read is the instrumentation that we recommend, but it can be changed and made adaptable to individual methods. I am of the opinion that an outline used as a guide to procedure will inspire confidence and assist the student during the transitional period.

What the Family Dentist Must Do for His Young Patients*

C. FREDERICK LEWIS, D.D.S., TORONTO, ONT.



OUR subject is so expansive and our time so limited that we have chosen only a few of the more important points which we thought might be of benefit to you.

In discussing the procedure of the treatment of children's teeth, our endeavour will be to place before the general practitioner a few concrete methods which we have found to be successful.

For the most part, this paper will deal with the deciduous more than the permanent set, because we feel that in comparison, they are the sufferers.

(1) We are taking the liberty of assuming that a large majority of dentists in general practice are not at all desirous of treating children's teeth. It is not an uncommon occurrence to hear a member of our profession make the assertion that he does not care to see a youngster come near his office. Of course, there are any number of our young patients coming to us for treatment who have been frightened either by hearing some member of their family describe the terrible experiences

*(Read before a clinic session of the Ontario Dental Convention, May, 1927.)

they have endured in the dental chair, or by their own actual experiences while having dental operations performed.

I believe that we as dentists are to blame for the greater part of this existing condition, a condition easily created but exceptionally difficult to remedy.

Right here, let us discard the word "temporary", when speaking of the deciduous teeth.

The word "temporary" is a misnomer and should never be associated with the first dentition; the assurance of something following is an excuse to neglect or to patch up the deciduous teeth which ultimately results in too early extraction and malocclusion of the permanent set. The parent as well as the child should be impressed with the idea that these first teeth have a definite function and play a most important part in the formation of the bones of the face, and if carelessly neglected, and consequently lost, the facial features are sure to develop out of harmony.

This is also an excellent opportunity to teach preventive methods such as proper diet, and early and regular visits for inspection.

Proper management of the young patient, by endeavouring to gain his confidence, absolute honesty as to what will and what will not hurt, and the first operation absolutely painless, are essentials to success in working with children. If the child is exceptionally nervous, arrange his appointments so that he may be present when another child, who is not frightened, is in the chair. In each individual case the operator must make a careful study of the character of the young patient and govern himself accordingly.

A thorough consideration of the correct dates of the eruption, calcification, and loss of the deciduous, and of the eruption and calcification of the permanent teeth, must be borne in mind by the operator at all times.

The order of treatment of existing conditions should be as follows: (1) Relief of pain. (2) Prophylaxis. (3) Putrescent pulps. (4) Vital teeth nearing exposures. (5) Carious teeth not in immediate danger. (6) Extractions.

After the relief of any pain, prophylaxis should be performed at the first sitting, and instructions as to the correct method of brushing described to the child. Insist that he presents a clean mouth at each appointment. After taking radiographs, to determine the amount of absorption, if any, all

root treatments should be begun at the earliest sitting possible, so that they may be carried to completion during the progress of other operations and completed in the briefest possible time.

Regarding root treatment prior to one year of the normal time of replacement, providing there are no contra-indications in regard to the general health, the same care should be exercised when treating a deciduous second molar or cuspid as when treating a permanent tooth. It is not a square deal to your little patient to take the short and most convenient method for yourself, of extracting that putrescent tooth. Of course, the partly resorbed and much constricted canals of a deciduous second molar cannot be thoroughly mechanically cleansed, but in a vast majority of cases they will readily respond to the following. First, if any swelling or pus is present, open and leave open to drain for a few days. Next, remove all decay, and the contents of the pulp chamber, and seal with temporary cement a treatment of tri-cresol and formaldehyde, equal parts.

If the canals are dry and no swelling present, use oil of cloves, campho-phenique or cresol in preference to an irritating drug such as formaldehyde. After two or three days, if there is no trouble, the canals should be cleansed with an explorer as carefully as possible. (Note here, broaches should rarely if ever be used in the canals of a deciduous tooth.) Place a drop of hydrogen peroxide in the cavity, and if there is no effervescence, dry and seal the cavity again with eugenol for a few days. At the next sitting, flood the cavity with silver nitrate solution, wait a minute or two, then precipitate; repeat this two or three times within the course of ten minutes. Next dry the cavity and fill part of the canal and about one half of the pulp chamber with an antiseptic paste. I would suggest a paste of zinc oxide, eugenol, tannic acid and thymol. This paste, together with the silver nitrate with which we flooded the canals, acts as a mummifier to the remaining contents of the canals. The idea of filling half of the pulp chamber with this paste is that the extra amount will prolong its therapeutic effect. Now, with an inverted cone bur cut a pronounced angular seat in the pulp chamber and fill the whole cavity with a temporary cement made up of zinc oxide, eugenol and a drop of silver nitrate, and leave under observation for a month. If the history is favourable after that time, a permanent filling of copper amalgam may be inserted. This treat-

ment should be checked up every three or four months. Where the tooth has developed a sinus, the cavity should be opened freely and Dakin's Solution washed through with an abscess syringe. Next place a pledget of cotton saturated with phenol in the cavity and force phenol out through the sinus with raw rubber; this will form scar tissue which heals very rapidly. If phenol cannot be forced through sinus, cotton wound on a broach, dipped in phenol, and placed in sinus will be sufficient. Proceed with root filling as before mentioned.

PULP CAPPING:

Pulps are exposed in two ways. First, by accidents with burs or instruments. This is a clean exposure. Second, by the extensive removal of decay. Capping a pulp that has been extensively exposed by the removal of decay should not be attempted; it should be devitalized and removed. A clean exposure made by a bur can be successfully capped and will remain vital for an extended period; some authorities claim that this method proves successful in fully ninety per cent. of cases. There are several methods used for pulp capping, but the following will bear mention. Dry cavity, cauterize with phenol, cover the exposure with a firm paste of eugenol and zinc oxide, place soft cement against the cavity wall and, without causing pressure, gently pat to place.

Another method is to place a crystal of thymol over the exposure and heat with a ball burnisher, then fill with cement made up of oxide of zinc and eugenol to which a drop of silver nitrate has been added.

Let me briefly mention the filling materials used in children's teeth:

(1) *Copper Amalgam* is the ideal and it stands out with many advantages over any other. Some of its advantages are:

- (a) It may be used where the cavity to be filled cannot be kept thoroughly dry.
- (b) It needs less retention than silver amalgam.
- (c) It is not as irritating as either silver amalgam or cements, and may be placed under the gum and nearer the pulp in deep cervical cavities.
- (d) It has greater edge strength than cement and the copper salts protect the margins from recurring decay. Its greatest disadvantage is its slowness in setting.

(2) *Copper Cements* have a limited field in children's work, and at the best they are to be considered as temporary fillings. Copper amalgam can be used practically any place where the cements are used, and it is more easily applied and much more permanent when placed. Mention might be made of two instances where copper cements may be used to advantage. These are:

(a) To flow over and protect the deep fissures in an erupting permanent molar.

(b) To tide over the condition of rapidly developing caries at the age of puberty.

(3) *Silver Amalgam* will be third and last choice. The enamel margins of a cavity in a deciduous tooth are so thin and brittle that they are not protected with silver amalgam the same as with the copper salts in copper amalgam. There is more danger of the pulp dying when a silver amalgam is placed near it, because it is such a good conductor of thermal changes.

One instance where silver amalgam has a decided advantage over the other filling materials is in distal compound cavities of second deciduous molars. A well contoured silver amalgam here will protect the mesial contact of the first permanent molar.

For very young patients, where it is impossible to prepare a cavity for a filling, also in cases where nearly all the crown is broken down, the use of silver nitrate every two months will retard further decay and sometimes keep the tooth in good condition for years.

A word regarding injuries to central incisors due to a fall or blow. A radiograph to determine the amount of root development is almost imperative. Where the pulp is not exposed, and where the patient is under twelve years of age, it is a mistake to try to restore the broken portion of the tooth. The patient should be kept under observation for a few years until calcification is complete.

Where the pulp has been exposed and calcification is not yet complete, administer a local anæsthetic and apply rubber dam if possible. Sterilize the field, and with a sharp round bur amputate the pulp about two mm. beyond the pulp chamber. The hemorrhage can be controlled with formocresol, after which a pulp capping can be placed in the pulp chamber and a cement filling placed.

DEVITALIZATION OF DECIDUOUS PULPS:

This is a most debatable subject. To the general practitioner, perhaps it does not sound logical that a pulp in a partly resorbed root should be devitalized. To the children's dentist, this is an everyday successful procedure, and the easiest and least painful method is the application of 1/50 gr. of arsenic for a period not exceeding twenty-four hours. As mentioned under the heading of "Root Treatments", it is impossible to completely remove all the contents of the canals, but the remainder can be sterilized and left.

EXTRACTION:

When the child is in normal health, before resorting to extraction, an attempt should be made to retain the deciduous teeth until the normal date of replacement. When necessary to extract before this time, the space should be provided with a space retainer.

Diversification of Vacations

G. R. MITCHELL, *Atlanta, Ga.*



WE farmers down here in the South hear a great deal about diversification of crops, the "scientifics" telling us that soil will be more productive if a different plan of cultivation is followed each year. Now take another look at the heading of the article and see if the meaning is clear. The idea is to follow a different plan of vacation enjoyment each year.

There are two points to consider in arranging a vacation: first, get away from your usual surroundings; second, avoid going to the same place and doing the same thing every vacation. Diversify each and every time!

The word "vacation" is derived from the Latin "vacatio," which means "freedom from a task." The best prescription for an enjoyable and beneficial vacation is to forget that you belong to the "labouring class" while you are away.

If you went on a development trip this year, try the mountains or seashore next year. Spend the following vacation back in the old home town and make a cross-country tour on the next one. Some men obtain diversification by taking vacation in the summer one year and in the winter another.

What Can We Do to Control the Ravages of Heart Disease?



HEART disease, cancer and pneumonia are the three greatest enemies of our race, and the greatest of these is heart disease.

Twenty-five years ago tuberculosis ranked amongst the most disastrous and claimed a running place with these three diseases, but now tuberculosis has been so controlled that it occupies only ninth place as a cause of mortality.

The examining boards of recruits for the Great War had to reject over 5 per cent. on account of crippled hearts. The examination of children on entering school, in the larger cities on this continent, has revealed the fact that approximately 2 per cent. of all school children have heart lesions or defects of such a character as to require medical care and advice. Two per cent. of all parties applying for life insurance every year are rejected on account of heart disease and it must be apparent that this only reveals a portion, inasmuch as no one knowingly suffering from heart disease is likely to apply for life insurance.

Unfortunately, the mortality from this dread malady seems to be on the increase. During the past five years there have been 3,435 deaths registered from heart disease, and 3,109 from cancer, and 1,718 from tuberculosis in the City of Toronto. In the preceding five years, or from 1917 to 1921, there were 2,635 deaths from heart disease, and 2,411 from cancer, and 2,203 from tuberculosis, heart disease having headed the list of causes of death for several years.

In view of the observations that have been made during the past fifteen years as regards the cause of the increasing prevalence of heart disease, it is difficult to understand that it should have required the revelations of a calamity like the Great War to re-awaken interest and stimulate a still greater endeavour to prevent or control its ravages.

Although 5 per cent. of the millions of recruits examined in Great Britain, Canada and the United States had to be excluded on account of heart disease, yet this does not fully reveal the truth as regards the prevalence of heart disease inasmuch as many were passed who had diseased valves, but who were considered fit to endure the hardships of war.

These facts, together with the statistics of life insurance companies, and the physical examinations on entering school, have directed attention to the causes and prevention of this disease.

Probably the most advanced step that has been taken in this connection has been the establishing of heart clinics in practically all of the larger cities on this continent. The result has been that the profession has been awakened to the fact that heart disease is much more prevalent in children than was formerly thought and that the foundation for the appallingly large number of deaths from this cause in middle life has been laid in childhood.

Consequently by turning to practical account the knowledge we now possess, many of the lives that are now being sacrificed in the very prime of life can be materially prolonged.

WHY IS HEART DISEASE SO PREVALENT?

In order to intelligently answer this, or to understand it, we must familiarize ourselves with the cause, or causes, of heart disease. To ascertain this, many investigations have been made within recent years, resulting in practically the same finding, and that is, that infection, either direct or indirect, is pre-eminently the most important cause of heart disease, and that the infective agent responsible for rheumatism heads the list.

In England, where rheumatism is much more prevalent than here, practically 50 per cent. of their heart cases can be traced to rheumatism and its first of kin, tonsilitis and chorea, or St. Vitus's dance. The latter is rather a result of rheumatic infection of the nervous system than a cause of heart disease, but reveals the presence of rheumatism and of an invasion of the body by the rheumatic toxic agent which is almost certain to affect the heart.

Unfortunately, rheumatism affects not only the membrane surrounding the heart and the lining membrane of the heart, but the muscles of the heart as well. Hence it is the most disastrous cause of heart disease. The balance of the cases are traceable, for the most part, to scarlet fever, diphtheria, all forms of septic infection, diseased tonsils, diseased teeth and gums, and, in the adult, to gonorrhea, syphilis, pneumonia, typhoid fever, influenza, puerperal fever or puerperal infection and, in fact, blood poisoning in all its forms, as well as in-

flammation of the various sinuses in the head. All of these have been known to be followed by heart lesions.

RHEUMATISM IN THE CHILD.

Rheumatism in the child presents an aspect very different from that which we find in the adult. There may be practically no joint symptoms or there may be only one or two joints affected, with the accompanying discomforts not infrequently referred to as growing pains, although careful examination in these cases will reveal an elevation of temperature and increased heart action.

Rheumatism in the child is very frequently accompanied by, or may be caused by, sore throat. In fact, diseased tonsils are looked upon as one of the most frequent causes of rheumatism or as constituting an incubator for the germs or toxic substances that are responsible for this disease which so frequently seriously affects the heart.

When these symptoms present themselves in the child, particularly between five and ten years of age, medical advice should be promptly obtained in order to detect at as early a date as possible any involvement of the heart, inasmuch as serious heart disease has been known to follow a mild attack of rheumatism. In the case of scarlet fever and diphtheria, especially in the latter, where antitoxin has not been used early, the muscle of the heart is frequently involved, resulting in degenerative changes and paralysis, which is usually the explanation for sudden death in this disease.

CONTROL OF HEART DISEASE.

Obviously the prevention or control of heart disease requires the co-operation of the family physician, the parent and the school authorities with the Department of Public Health.

This is extremely important inasmuch as our hope in these cases lies in the early recognition of any heart involvement. If this is found, the patient should have a more or less prolonged rest in bed, with an ample supply of fresh air, sunlight and proper food; the rest to be followed by graded exercise.

Inasmuch as there is a close relationship between rheumatism, chronic tonsilitis or diseased tonsils, adenoids and heart disease, also between diseased teeth and gums and heart involvement, if we are going to hope to reduce our mortality from heart disease in middle life, we must begin with childhood in which,

in a large percentage of cases, the foundation is laid for the chronic heart diseases that claim so many in the very prime of life.

This means that following all attacks of the acute communicable diseases a careful examination of the heart should be made and, if any involvement of that organ is recognized, slow convalescence is essential. Unfortunately this frequently places the family physician in an awkward position, as he is rather fearful that his patient may think that he is making a long case out of a short one. However, it must be borne in mind that most of the disastrous results, whether they be immediate or remote, of rheumatism, diphtheria, scarlet fever, septic sore throat, diseased tonsils, diseased teeth and gums, or, in fact, of all septic conditions, are dependent upon the degree of heart involvement; this in turn largely depends upon the rest and care given the heart until its recovery or until sufficient compensation is developed to enable it to carry on under careful instructions. Hence the necessity for ample convalescent home accommodation for all such cases, and it is important to bear in mind from the economic standpoint that cases can be cared for in convalescent homes for practically one-half of what it costs in hospitals.

To summarize then, the control of heart disease amongst children must depend, first, on the careful watchfulness for these conditions which predispose to or result in heart disease, and secondly, on the care and control of the children who have already fallen victims.

For the first, it must be apparent that we must have adequate control and care of all communicable diseases. There should also be supervision of all contacts in what is referred to as the "rheumatic family," inasmuch as there can be little doubt that with rheumatism, as with cancer, it is quite possible that we inherit a predisposition at least to this disease. Another object of the supervision of the contacts is that while one member of a family may have had a rather severe attack of any of the diseases referred to that are likely to be followed by heart involvement, there may be others in the family who have had milder attacks of the same disease and yet who have heart complications which have, up to that time, given rise to no serious symptom.

We have heard much about the contagiousness of rheumatism. Whether it is so or not has not been definitely deter-

mined. This suspicion has probably arisen from the fact that some forms of the streptococcus, such as we find in diseased tonsils, and also the form of streptococcus which is peculiar to the alimentary canal, particularly the intestines, are claimed to be responsible for the disease. It has, therefore, been concluded that it is possible that this disease may be transmitted from one to another.

Then there is the extreme importance of the focus of infection, or foci of infection, such as already referred to—the tonsils, adenoids, the various sinuses and accessory cavities of the nose and throat, abscesses at the roots of the teeth, etc.

In addition to this, it must be remembered that, after all, the most potent factor we have in safeguarding ourselves against disease is the natural resisting powers of our bodies. These can only be kept at the maximum by surrounding ourselves with all conditions essential for the developing of physical fitness, such as an ample supply of food, intelligently selected, which should constitute a properly balanced diet, plenty of fresh air and sunshine, rest, sleep, with all proper hygienic surroundings. Those that are predisposed or susceptible to rheumatism should avoid damp climates and damp houses.

For the active cases of heart disease, if they cannot be properly cared for in their homes, they should be in a convalescent home, inasmuch as the most important factor in connection with the treatment of these cases is rest. The heart is the one organ in the body that never rests. The only time that it gets anything approximating rest is in the recumbent posture, or when we are lying in our beds, with a mind at ease. The necessity for this rest can best be understood when we realize the fact that with every contraction of the heart under normal conditions a pressure equal to twenty-five pounds to the square inch is exerted on the large vessels immediately after the blood leaves the heart, that this is repeated from seventy to eighty times every minute, and that the blood is forced along at the rate of ten inches per second.

It must be evident that if we have an inflamed heart muscle or lining membrane or membrane surrounding the heart, like the inflamed joint, or inflammation in any other part of the body, our hope for improvement must primarily depend on rest, or quiet as nearly approaching rest as we can possibly secure, for the diseased and inflamed organ.

If you are approaching middle life, do not fail to have your

family physician make a careful examination of every organ in your body at least once a year (say on your birthday) and in this way make sure that every organ is functioning properly.

DISEASES OF THE ARTERIES.

Hardening of the arteries is intimately linked with heart disease as a cause of premature old age and death. Here we have a most marked relationship between age and disease, inasmuch as in the vast majority of people degenerative changes in the arteries begin to take place about thirty-five years of age. In some the changes are rapid, depending on other factors, while in others they are slow and so insidious as to escape notice until advanced years. However, if we all inherited perfect arteries and if our lives were less strenuous and our health habits more intelligently guarded, these early degenerative changes would not take place. As we cannot choose our parents and grandparents, we have to make the best of the material that we have inherited and endeavour to reinforce any weaknesses by avoiding those things that tend to overtax our arteries, bearing in mind that they are on duty twenty-four hours every day as long as we live, and, like our hearts, they never rest, the nearest approach to rest being when we are asleep.

WHAT ARE THE CAUSES OF HARDENING OF THE ARTERIES?

Arterial sclerosis, or hardening of the arteries, has been recognized for centuries, and much effort has been expended in seeking the cause. Heredity no doubt plays an important role. As Sir William Osler so fittingly expressed it, "The different qualities of vital rubber that enter into the make-up of our vascular tubing, or arteries, as indicated by the development of hardening of the arteries in early childhood, would be difficult to explain in any other way than by that of heredity."

While a certain percentage of these cases are due to syphilis, yet in many cases occurring in early life no trace of syphilis can be found. Hardening of the arteries is for the most part a disease of advanced years, beginning at about forty. Many factors enter into premature hardening of the arteries. The strenuous life which characterizes the age we live in must certainly play an important role; keen competition, business worries, burning the candle at both ends, eventually make

their demands, and the man who has won laurels, either in the commercial world or in the professions, oftentimes pays the price with premature hardening of the arteries.

Excessive worry is quite as disastrous, if not more so, than excessive muscular exertion. Worry is one of our greatest enemies. Eight hours' hard work, that is physical or mental, would not be injurious provided we could completely relax after we have left our business, and at night enjoy eight hours of carefree sleep. This is a wonderful restorer of both nerve and muscle energy. Worry interferes to a greater or lesser degree with all the functions of the body and, consequently, in addition to making relaxation practically impossible, it favours the accumulation of toxic substances in our blood, which oftentimes affect our whole vascular system.

While general arterial sclerosis, or the high pressure type, most frequently occurs among those holding responsible positions which entail excessive mental strain, yet muscular overwork is frequently responsible for local arterial sclerosis such as we experience in the arms or legs of those engaged in physical work. If the occupation even in manual labour entails heavy lifting, the entire arterial system is likely to become involved.

In nearly all of these cases a careful history will reveal the presence of some toxic agent.

With our ever-increasing knowledge of the far-reaching influences of the infectious and contagious diseases on the heart and arteries, we fully appreciate the role they play in arterial sclerosis and the most important of these toxic agents is syphilis, especially after forty years of age. However, all of the communicable diseases have been shown to be contributing factors in a greater or lesser degree.

In recent years focal infection has been shown to play an important role. This includes infected teeth, more particularly abscess formations at the roots of the teeth, diseased tonsils and adenoids, diseases of the various sinuses leading off from the upper respiratory tract, the gall bladder, the appendix and the intestinal tract. There can be little doubt of the absorption that takes place where there is not at least one free movement of the bowels every day.

Arterial sclerosis, like heart disease, frequently has a previous history of rheumatism.

In chronic Bright's disease we usually have increased blood

pressure and consequently hardening of the arteries. In fact any pathological condition that gives rise to increased blood pressure is very likely to be followed by hardening of the arteries. Unfortunately high blood pressure has been attributed in many cases to hardening of the arteries, or arterial sclerosis, while as a matter of fact the reverse is almost invariably the case; the hardening of the arteries is the result rather than the cause of high blood pressure.

Over-eating is not an unusual contributing factor in premature hardening of the arteries. However, while this is recognized as playing an important part, yet there are many who live to a good old age with very little hardening of the arteries, that have never experienced any discomfort in that way and yet have been hearty eaters all their lives. The danger is not so much due to the quantity of food consumed, as the quality, and our digestion or powers of assimilation. For instance, excessive nitrogenous foods, such as meat, fish, eggs, etc., and also highly spiced foods, are much more stimulating and toxic than are the carbo-hydrates, fruits and vegetables.

That the vast majority of us eat too much after middle life cannot for a moment be questioned. This is especially true of our consumption of meat which should not be indulged in more than once a day after forty, unless we are engaged in physical labour, and if our vocation is of a sedentary character we should even reduce the amount consumed once a day by one-half after fifty years of age.

As already intimated, high blood pressure is probably the most important factor in the production of premature hardening of the arteries. High blood pressure is only a symptom or an indication that there is some obstruction to the normal blood current or some undue stimulation. Your medical adviser will endeavour to find the cause and relieve it.

The next most common cause is disease of the kidneys. While arterial tension nearly always is preceded by diseases of the kidneys, yet in some cases the increased arterial tension has preceded the kidney involvement.

WHAT IS THE REMEDY?

Inasmuch as many cases of chronic heart disease in middle life can be traced back to the toxic effects of the various communicable diseases in childhood, from which the individual, or his heart at least, never recovered owing to too short a

period of convalescence, we must see that the children do not resume their play or work until the heart has become normal, or has at least established sufficient compensation for the physician to decide that they can safely do so.

The same advice would apply to the adult convalescing from any fever or any septic condition that may have involved the heart.

Departments of Health and Boards of Education have taken the initiative in checking up these conditions by requiring two complete physical examinations during the school period, one on entering school and the other in the fourth form. In addition to this, however, every person should have a complete physical examination at least once a year, after thirty-five years of age, and twice, after fifty. The object of the periodic health examination is prevention, not cure.

There can be no doubt that many who are dying in early middle life could have their lives materially prolonged by knowing what precautions to take in order to prolong the usefulness of an already diseased organ.

The periodic physical examination is merely taking an inventory of our physical assets, as they are our most valuable stock in trade. Every business man takes an inventory of his stock periodically. He also has his engines and his motors carefully overhauled at least once a year, usually two or three times. Why not his own human machine, the most perfect and yet the most neglected and abused of all machinery? A periodic examination will not only add years to your life, but will enable you to enjoy life more abundantly.

It is in middle life when the extra stress, physically and mentally, is placed upon us that the diseased heart, diseased kidneys and hardened arteries are likely to give way if we have not been advised as to how to intelligently protect them.

Make it a rule to go to your family physician at least once a year for a complete examination. We advise your family physician as he is the one in whom you have placed the sacred trust of safeguarding the lives of yourself and your family. Should your physician, however, make light of your request for a physical examination, we would advise you to secure an examination through some other channel. Do not fail under any circumstances to protect yourself by this examination.

From an economical standpoint the money used is an investment, not an expenditure, and will give you larger returns

than any other. If your doctor assures you that all of the organs of your body are sound and functioning normally, so much the better, and it is surely worth the price to have that assurance and the ease of mind which necessarily follows it.

Let this examination be an essential part of your birthday celebration.—*Toronto Health Bulletin*.

Malignant Growths



THE dentist does not always scrutinize every part of his patient's mouth to discover whether there may not be conditions which, though not malignant at the time, may become so. If he does not feel that he is qualified to judge of the nature of the abnormal condition found, he should send the patient to one who is. All new growths should be considered precancerous, since it is well known that early removal of cancer may mean permanent cure while delay means much suffering and death.

Carcinoma and sarcoma, two malignant growths of the mouth differ in that, with rare exception, carcinoma of the mouth is found only in individuals beyond middle life, while sarcoma may occur at any age. Carcinoma may attack any part of the epithelial tissues of the mouth. Most of the cases seen seem to have originated in the sulci at the duplicature of the mucosa and gum. Leucoplakia lesions on the tongue or other parts of the mouth tend to become carcinomatous. When a carcinomatous growth has attained some size it tends to assume a cauliflower appearance. When it ulcerates it has a distinctive odour, and the patient generally experiences much pain. The cervical lymphatics sooner or later become involved, either from the infection or in secondary carcinomatous growths.

Sarcoma of the mouth, except in connection with the bones of the jaws and periosteal tissues, is uncommon. The spindle and round cell sarcomas are malignant in the sense that they cause metastasis. The more rapidly growing carcinomas and sarcomas are the most malignant.—THOMAS L. GILMER (*Journal of the American Dental Association*, May, 1927).

Toys as Pediatric Armamentarium*

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[Do we understand our juvenile patients and secure their interest and co-operation to the extent that we should? Our difficulties may not be entirely the fault of the child! Doctor Sobel's paper will help the general practitioner as well as the Pedodontist and Orthodontist to a better understanding of the problems to be faced in rendering dental health service to the younger members of our communities.—EDITOR.]



It is patent these days to all physicians who are charged with the responsibility for the supervision of children, that it is more important to study and know disorders and diseases in children than disorders and diseases of children. The time has long passed when we can approach the care of children from the standpoint of physical disease alone, for only too often we must manage and treat the child as a whole—his mind, his body, his very soul—rather than the condition from which he is suffering. It is as Dr. Parry was wont to say: "More important to know what kind of person has a disease than what kind of disease a person has."

Children, particularly those of the age from two to seven years, are the kind of persons who have traits, tendencies, inclinations, susceptibilities, propensities, aptitudes, adaptabilities and reactions peculiar to that age, and an understanding of the importance of these qualities during the mouldable and impressionable period of their existence and a proper guidance at this time mean much in their later life. As Thom states: "The four fundamental characteristics of plasticity, suggestibility, initiativeness, and love of approbation are dominant during the first few years of life and are invaluable assets in our efforts to model and remodel personality."

It is my purpose in this communication to present and discuss the value of a number of selected toys as they can be applied in office practice in securing the attention, the good-will, the poise, the confidence and the co-operation of the little patients and in this wise to make the physical examination

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easier and more thorough and, therefore, the supervision and treatment at the office and indirectly at home of greater benefit. At the same time I hope to touch upon the subject of toys in the sense of the selection, care and use of permanent play material in the home, and the effect of such upon the child's training and character.

No attempt will be made to enter into an extended discourse of child psychology and behaviour, although for a proper appreciation of the subject, some phases of both must necessarily be alluded to in brief. The most that I have to offer is what I consider a practical, common sense, human, psychological approach to the child by the pediatrician in his office through the medium of these adjuvants—toys. What I have to say may appear to some as too simple to warrant discussion; but it is because I have found that the little things, the smaller details in pediatrics, are so often disregarded or taken for granted and because these so-called minor considerations are so often of inestimable value, that I venture to come before you with a topic that may appear trite and self-evident.

It has been said that children like to be alone. They do like to be alone—with their toys. But with their toys, if of the proper kind and selection, they are never alone, for they are at once transplanted to other lands, to the land of make-believe, not in the dream sense, but rather in a practical working way, there to become with their toys a merchant, a house-keeper, a baseball pitcher, a teacher, an engineer, a knight, a queen, a general, or some other real, active, living being.

Toys properly used furnish a stimulation and an outlet for interest, imagination, wholesome and productive activity, and social co-operation, and tend to dramatize life in its actual everyday workings.

For many years it has been my custom to have on a table in my office, alongside of my desk, a number of small and inexpensive toys. They have been my friends and helpmates for a long time in my practice of pediatrics. I have read somewhere or I have been told of a teacher in diseases of children, who at the opening of his lecture course entered the room with a large valise in his hand, opened it and addressing the class said: "Gentlemen, I am going to show you some of the instruments which I have found useful in diagnosis, care and treatment of diseases of children." He then proceeded to withdraw from the valise a variety of toys. And so to-

night I am going to show and discuss with you some of my pediatric instruments, some of my stock, my toys—which have been so useful to me in my supervision and care of children.

It is quite commonplace to say that in order to examine children properly one must gain their confidence and attention. Too often this is easier said than done, for frequently the examination must be conducted not only without their co-operation but often against their will. I need hardly tell you of the many “battles” that ensue before a proper physical examination of children, especially of the mouth and throat, can be made. Kind words, coaxing, promising, are often of no avail and one is sometimes put severely to the test of knowing how to proceed. Many friendships of children are lost forever after forcible examination of the throat, and subsequent examinations become increasingly difficult. The child may forget or even forgive many things but the thought of that throat examination lingers. It follows therefore that any simple measure which has for its object the gaining of the little patient’s attention, his poise, his friendly approach, his lack of fear, and his confidence—anything which makes him feel that he is in the presence of and in the hands of someone who is kindly disposed towards him—will go a long way to secure a thorough and proper examination.

In order to appreciate the working plan of toys for our purposes, it is necessary to refer to certain prominent characteristics of the young child. More especially I will mention activity, curiosity, imagination, lack of concentration and suspicion. The child of runabout or pre-school age is the nearest approach to a perpetual motion machine that I know of. He is always stepping on the gas, his foot is on the accelerator all the time. He is forever on the go and for that reason rebels against restraint. Curiosity is every child’s middle name. It is inherent in him. He has been referred to as the human interrogation point and not without good cause. He is always seeking information. He wants to know. In how many of your ears does the “why” of children ring? Sometimes his curiosity, which is always pronounced, leads him to perform acts which are misinterpreted as acts of cruelty, destructiveness or misbehaviour. Stecker says: “I do not believe that I have ever seen a child whose curiosity was so excessive that it could be labelled pathologic. On the other hand, the child who does not pass through the question-

ing phase and apparently cannot be stimulated to want to know, and seems unable or unwilling to take any steps to acquire bits of information, is probably not well balanced in his growth." Imagination is one of childhood's greatest assets. It is always working, always vivid. It is one of the characteristics which should be fostered and properly directed and guarded, for it is a two-edged sword. The lack of concentration for any great length of time is a characteristic part of the child's makeup. The child will give his attention often promptly and without effort but not for an extended period, because he is always on the lookout for frequent change. Diverted attention, flitting from one thing to another, is a distinct childish trait. The child, too, is naturally suspicious, or as Ely puts it: "The general attitude of the child who is brought for examination is one of suspicion, especially if he has previously been roughly handled, and this attitude must be changed if we would succeed in our task. Once a child's confidence is gained, the rest is easy."

It is the aforementioned qualities of childhood which in the main must be taken into consideration in any plan of action to gain his attention and co-operation for a thorough examination, and it is through the medium of toys that the proper expression, development, expansion and control of these qualities can often be secured in large measure.

The child with toys is preoccupied, particularly if they are of the constructive kind. He is having something to do, he is in contact with tangible things and therefore less likely to lapse into day dreaming with all its serious consequences of maladjustment in later life. To quote Minnetta Sammis Leonard: "If activity is properly directed there is not only the habit of happy employment but of productive employment. From productive activity comes self-respect and happiness for the individual. Also out of this develops the individual of the most value to society—the producer, the creator."

Toys for children have ever been the means of bringing happiness into their lives. Play which kindles the childish imagination is every child's right, and toys have always made for play and for playmates of parents and children. In this way they make for genuine companionship of parents and children, for home as a centre for child and friends, so important in the child life and psychology of to-day.

The selection of toys for pediatric office armamentarium

is important from many angles. In the first place they should not be expensive, because frequently they are asked for by the little ones and sometimes they are promised by the doctor in order to gain his point, and when once promised they should always be given and when asked for an opportunity is afforded for compromise and for securing co-operation. More than that, when once given they should never be taken away lest the child's sense of injustice be aroused and his confidence shaken. No child's confidence has ever been gained and held by deception. The toys should of course be of the sanitary kind. They should not have sharp edges likely to cause injury, nor be fragile and easily broken, and thus likely to develop a sense of irresponsibility and a feeling that if he breaks or destroys one he will readily secure another. These toys when once handled by the child should be kept by him or thrown away in order to avoid the possibility of infection of others.

The average layman looks upon children's toys merely as a gift of pleasure or pastime, but from the pediatric standpoint toys have a wider field of application. They should not be used merely to afford pleasure or focus attention, but rather to teach some lesson of restraint, composure or control, health habits, unselfishness, co-ordination, concentration, companionship and co-operation—in short, to aid in the development of character and the maintenance of good health.

Modern effort to educate and train children in the rules of health and proper living is by way of action in the form of toys and games rather than by mere didactic instruction. The old method of teaching lessons of hygiene to children by instruction or by doing things for them is now *passee* and in its place we have come to teach the lessons of child welfare, more particularly health, food and living habits, in a more practical lasting way, by having children do things for themselves. In other words, we are persuading children into health through play. "Health for health's sake" does not make any special appeal to children, but when they are shown that proper living and the establishment of good health habits make for comfort, safety and long life, and particularly when these lessons are brought home through toys, games and play, the children immediately begin to take an active interest in health matters. Following these individual improvements in well-being comes the child's interest in the family and later on in the health of

the community. Health teaching of children in order to be productive must be "alive." The interest and imagination of the child must be aroused in a practical way, and child psychologists and pedagogues agree that the latter are best stimulated by toys and games of various kinds.

The mere presence of toys in your office will often be the means, at least it has been so for me, of being able to determine the conduct or behaviouristic tendencies of the child. There are children who, when seated on the mother's lap or in a chair at the time of visit, will glance inquiringly at the mother and longingly at the toys, but will refrain from touching anything or will finally ask through the mother if they may have one. This marks the child of good breeding, good taste, good habits and good discipline.

There are others who, as soon as they enter the office, as soon as they see the toys, will at once proceed to handle, disarrange, appropriate or destroy one or more of them, without permission or question—an evidence of improper training and little inhibition.

There are still others who will take a middle course and ask for the toys, but when told that they must wait or be patient or that they may have one after they are examined, will begin to cry and shout or stamp their feet or fall on the floor and kick about and become rigid—the familiar tantrum child, who wants what he wants when he wants it—and usually gets it at home for the sake of the so-called family peace. This is the child of whom Florence Bamberger has said: "Later on when the kindergarten opens wide its doors and invites this autocratic ruler of an absolute monarchy to participate in the affairs of a social democracy naturally there follows a sad story of difficult adjustments and conflicts. Is the child naughty? Not at all—he has simply learned to respond in the way his parents taught." In these instances, it is apparent that an insight into the child's makeup and his home environment is readily obtained.

There is another angle to these office toys which I might term environmental. Children are readily influenced temperamentally by their surroundings. Placed in a doctor's office which is homelike, with toys of the kind that father and mother like to give, makes them feel at home and in repose; and if in addition they are assured that you are an uncle—not neces-

sarily a rich one—your victory for securing the child's confidence is practically assured.

Then, too, it is possible by observing the child's approach to the toys and his selection to get a line upon his constitutional makeup. The boy who singles out and plays with dolls is not likely to be as virile as the one who selects a baseball, a tennis racquet or a steam engine, a kite or a waggon.

It is unnecessary to go into great length or detail of the special kinds of toys which serve the purposes indicated. Most of them will suggest themselves and others can be added from time to time as experience grows or as they are given away. I will mention a few that I have used and indicate how they have served me. They are Jocko, Smiling Jim, Restless Ann, dolls, toilet articles—soaps, powder, mouth washes—toilet seats, food articles, hand brushes, wristwatches, telephone, purse, banks, animals, the three wise monkeys, bowling sets, building blocks, baseballs and bats, tennis racquets, rubbers, cooking sets, dishes, furniture sets, travelling kits, etc.

Jocko, the animated monkey, is used as an introduction to the child and to gain his attention. He is manipulated a la Punch and Judy, by placing the index finger in the hollow of the head, the middle finger and thumb in the arms. Jocko is asked, Do you like Willie? and he promptly bows his head in the affirmative. The child is then asked if he would like to shake hands with Jocko, and upon his nodding "yes" Jocko's hands are extended to Willie and Jocko and Willie are formally introduced. Jocko then rubs his ears, holds his hands over his nose and mouth before coughing and sneezing, bows, and the introduction is completed by telling Willie that Jocko like all good boys must now rest and go to sleep. Jocko is placed on the table or shelf to rest and by this time Willie is usually quiet, has become your friend and Jocko's too, and you are ready for the examination.

Smiling Jim is my standby for those children who will not open their mouths despite all pleading. He is made of rubber, and when asking him in the presence of the child, "Show me your tongue," you gently press laterally or anteroposteriorly and the tongue is protruded and little Willie is shown what a good and obedient boy Jim is.

Restless Ann is a weighted toy girl so adjusted that it will not remain in the horizontal position. Like many neurotic children she will not be kept down. I have used this toy

often for this type of children to show them how to remain set and conserve their energy instead of, butterfly fashion, going from one place to the other—and it has worked.

Dolls, of course, always appeal to the little girl. Instinctively the maternal is there. There is sufficient of colour and dress for her to make a selection and the promise of keeping one often brings the reward of passiveness and ease of examination. Then, too, the statement that the doll—which by chance only has the same name as the child—is a good, obedient and helpful girl, will often bring about happy results. A miniature bath thermometer and bathtub in connection with the doll open up the theme for bathing the baby and general cleanliness.

To have children wash their hands and faces is at times a difficult task. To get them to wash their necks and ears is an accomplishment. Cleanliness is next to godliness, it has been said, but it takes some children a long time to “get next.” It follows then that any means or device which will result in body cleanliness is a great desideratum. Here, too, I play the game of cleanliness with them. For this purpose I use a special soap marketed in the form of small transparent glycerine cakes in the centre of which is incorporated a picture card, printed on both sides, showing either some inanimate theme—a waggon, a balloon—or better still some active theme demonstrating a health habit—washing hands, taking a bath, brushing teeth, sleeping with open windows, exercise, boating, skating, playing ball, kite-flying, etc. These pictures remain in the soap until the last vestige is used, in fact, the designs become clearer and clearer the thinner the cake becomes. These soaps actually “kid” the youngsters into washing themselves if only for the pleasure and excitement of watching the pictures as the bar thins out with use. Through their use is driven home not only the lesson of cleanliness but other lessons of child hygiene as recorded on the different pictures.

The toilet seat, while hardly what could be termed an elegant toy, often drives home a useful lesson—namely, the habit of daily bowel evacuation at a given time. I have on many occasions succeeded in establishing this regular habit by simply having this toy placed on a chair before the child while seated on the toilet or pot de chambre and having him reminded of how little Tommie became a strong and healthy boy by going to stool every day before breakfast.

The food articles, usually of papier mache or rubber, give a lead for dietetic instruction, and the partaking of milk, eggs, meat, fruit, bread, vegetables, cereals, etc., as the case may be, often follows their demonstration and their presentation to the child. A wristwatch is used to direct attention to the regularity of feeding time, proper rising and retiring, and rest periods during the day, the latter so useful in cases of malnutrition and fatigability. A small hand brush points the way for lessons of cleanliness and the washing of hands and nails before and after meals, and after attending to the wants of nature, all so important especially in the pre-school age, the age of "dirt infections" when germs "live a hand-to-mouth existence."

The toy telephone is used to stimulate the imagination and direct attention to the actual routine of daily life—talking to father and mother, giving orders to tradesmen, conversation with a friend or playmate. With the proper use of the telephone, gentle tone of voice, politeness, patience and self-control are developed. The purse and the bank are used to inculcate lessons of thrift and counting of change.

Animals—dogs, cows, lions, tigers, elephants, horses, ducks, camels, etc.—always attract the child's attention. They serve the purpose mainly of entertainment, it is true, and of giving opportunity to converse with the child and in this way to gain his attention and quiet. They also serve to remove in some instances or at least to modify the fear which some children have of animals. The cow, of course, affords opportunity for a talk on milk and its importance as a nutritive. The three wise monkeys—hear no evil, say no evil, see no evil—carry with them the lesson of self-control so necessary in both young and old for the restraint of temper, tongue, emotions and inclinations. Miniature bowling sets develop a sense of distance and direction and make for co-ordination, patience and social companionship. Building blocks develop concentration, association and constructive action.

Furniture and cooking sets call to their minds orderliness, care and economy of materials, table manners, household duties, and suggest home, "where the 'playmother' is afforded opportunity for outlet and where friends and imaginary neighbours can be invited for social intercourse."

These few examples suffice to indicate the almost endless possibilities of approach to shy, apprehensive, restless or boist-

erous children and the means of securing attention, co-operation and submission, and of keeping the child preoccupied and busy. Call the method bribery, call it amusement, call it suggestion, call it camouflage, call it what you will, the results in many cases—not all—speak for themselves, because these various toys afford the physician a “talking point” with which to sell health habits, good training, character development, and proper adjustment to children.

Time there was when toys were so expensive that they found their way only into the homes of the better situated classes. To-day shops of many kinds are literally flooded with varieties of cheap toys and novelties within the means of all. It is unnecessary, of course, to say that many of them are useless for the purposes indicated by us and that judicious selection is therefore necessary, for toys of the improper kind can have as baneful an influence as those of the right sort can make for healthful development. They must be selected with due regard for age, sex, temperament, mentality, environment, dominant interest, immediate need, and at times for special conditions of disease and deformity as noted by Henry Keller.

Toys should not be given merely to meet a fleeting pleasure or desire but always with an objective in view. Mistakes are frequently made by giving too many toys and giving them too frequently or by giving toys unsuitable to existing conditions. There are homes in which one will find a veritable depot of toys, given to meet the whims and wiles of the child, and yet these children are constantly asking what they should do. They are given so much, and not infrequently the best at first, and are given it so often that the thrill has been lost and for the moment there is nothing new at hand. A proper toy should create not only interest on the part of the child but should make for concentration, occupation and application over an extended period.

The toy should, as stated, either demonstrate or create a good health or living habit, or develop a sense of continuity, of application to the toy until the task is done. Constant changing from one toy to the other not only develops a lack of economic sense but tends to make the child unstable instead of “*stabile*” and to create a state of mind in which many things are begun but few are completed. Such a situation makes for maladjustment and malcontent in later life.

Only too often toys are given in order to induce the child

to eat, to sleep, to move its bowels, to wash, to dress, to retain its urine, in other words to help overcome what Cameron has so well termed negativism in the child. Such use is of course misguided and simply means that the child never will do what it is normally asked or expected to do, without a reward, or as Loewenburg puts it: "Without exacting its price, without exerting its power, without creating a scene, without vomiting if it is forced to eat. These children do not need a doctor. They need new parents or the parents require reformation."

There is a practical and economic side to these toys in that children often request parents to take them to the office for more toys and incidentally for added visits. Because of these return visits it is important in selecting office toys to purchase those of the so-called open stock or staple variety, those which can readily be replaced at all times and at small cost.

Inspection, almost a lost art in medicine to-day, is most helpful in childhood. Often enough observation alone determines a diagnosis, and while the child is busy with a toy and relaxed, one may observe objective signs and symptoms—gait, attitude, posture, nutrition, facial expression, physiognomy, etc., which aid to establish a diagnosis. Snap diagnoses are more often correct in childhood than in adult life because ailments in childhood are as a rule uncomplicated by the living conditions and abuses of adult life.

Of course, the application of these toys as used in the office can be carried away by the parents for home consumption, or others can be purchased under the guidance and with the advice of the physician or teacher. Habit formation predestines one's future in a large measure and therefore the importance of good habits in the pre-school age is of tremendous importance. As Angelo Patri says: "Habit is a cable. We weave a thread of it every day until at last we cannot break it. There is nothing more worth while in the whole field of child training than the formation of good habits. They increase the power of a child to do good to himself and there lies the hope of all teachers and all fathers and mothers. Good health lies at the bottom of all good habits. It is not to be taken for granted. It must be acquired as any other good habit is acquired by purpose and effort and constant practice."

The pre-school age is the most plastic, most sensitive, and most impressionable period of life. Improper care at this

time may mean a life of discomfort, non-resistance and disease. It is then that the child is most exposed and susceptible to the contagious, respiratory and gastrointestinal diseases, which, if they do not kill, may maim him or destroy his usefulness in life. It is then that habits are formed, mental impressions made, and character moulded, which may determine whether the future child and grown-up is to become a useful member of society, or a burden to himself, his family, his friends and the state. The many gastric, nervous and other insults to which he is exposed through ignorance, carelessness, indifference or neglect, not infrequently prove to be the forerunners of chronic disturbances in after life. Health habits, such as oral and nasal hygiene, proper sleep, rest, mastication, general bodily cleanliness, fresh air, exercise, control of bladder and bowels, mental hygiene, carriage, posture, etc., all come within the province of the supervision of children of the pre-school age. Nutrition at this time is a most important consideration, and concerns itself not only with the passing disturbances of the gastrointestinal tract, but with the proper adaptation of food in quantity, quality, proportion of ingredients, and preparation to growth, development and resistance. Malnutrition at this time, due either to insufficient or unsuitable food or faulty health habits, may be the forerunner of nervous diseases and tuberculosis, as well as of anæmia, mal-development, lack of ability to concentrate, and the cause of general listlessness and intellectual sluggishness.

Dr. V. A. Henmon says: "We are witnessing to-day, however, a great change in our conceptions of the educational importance of the early years and as a result of closer study of infant behaviour and of increasing knowledge of the way in which early habits, acquired likes and dislikes and emotional attachments are built up and the way in which they condition the individual's entire life. So far from being unimportant, all the evidence we now have goes to show that if there is any one most important period in life for education it is not the period of adolescence but rather the first six years of childhood. It is in these years that fundamental character traits and patterns and probably even vocational bents and aptitudes are determined."

It is apparent, therefore, that the physician can play a part in the character building of the child second only to the parents, for I believe with Nathan Oppenheim: "Parents

control the bodies and minds, the hearts and souls of their children not so much by what their ancestors were, as by what they themselves do and think."

Before closing I should like to say that those who are interested in toys and play will find in a pamphlet entitled "Best Toys for Children and Their Selection," by Minnetta Sammis Leonard, and in a book entitled "Permanent Play Materials for Young Children," by Charlotte G. Garrison, an excellent presentation of the subject from its many angles. To both of these authors, upon whom I have drawn freely, I am indebted for much valuable information.

This article, as I stated at the outset, is presented as an intimate and personal one or, if I may say so, as a practical and human approach to children from the standpoint of the pediatrician.

To feel with the child, to look at life "through a child's eye," to reach the mind, the heart and the soul of the child, is a goal worthy of the best of doctors and teachers, and the use of toys and play is one of the means toward this end. What we should aim at, after all is said and done, is to have the child well fed, well led, well bred, and well read.

There are two great games played by all mankind all the time—the game of life as it is and as we find it, and the game of health as we wish it and strive for it. In these games, the use of toys properly selected and directed, especially during the sensitive, impressionable, and plastic period of early childhood, is a powerful instrumentality for future health, happiness and adjustment.

Dental Index Bureau



THE sixth of the series of ten volumes comprising the set from 1839 to date of the Index to Dental Periodical Literature has recently been published.

The following are the volumes that have been completed: 1839-75 (completely sold out); 1876-85 (nearly sold out); 1886-90; 1891-95; 1911-15 and 1916-20.

Those in the course of preparation are for the years: 1896-1900; 1901-05; 1906-10 and 1921-25. The copy for the 1921-25 book is now in the printer's hands and we hope to be able to make early delivery for it. Our success in this

direction will be governed in a measure, at least, by the manner in which our subscribers respond in purchasing the present volume.

The price for the book remains at \$6.00 to points within the United States and Canada, and 6.50 to all other points, and it should be ordered from the Secretary, Dr. A. Hoffman, 381 Linwood Avenue, Buffalo, N.Y.

Intensive Oral Hygiene Campaign in Saskatchewan



THE Canadian Dental Hygiene Council, working through the Saskatchewan Dental Society, and with the co-operation of the Departments of Health and of Education of the Province of Saskatchewan, is planning an intensive Province-wide Oral Hygiene campaign to begin February 15th, 1928, for which purpose the Province is being divided into sixteen sections, with a chairman appointed for each section. Dr. H. S. Thomson, Field Officer of the Canadian Dental Hygiene Council, has spent a short time in the Province making preliminary arrangements, and will return in time to complete the organization.

The plan of campaign adopted is to include the following:

1. An intensive educational Oral Hygiene effort, endeavouring to reach every man, woman and child in the Province, through audiences, organized Clubs, groups, Schools, Colleges, Normal Schools, Fraternal Societies, Churches, etc. When possible and practicable, every Dentist will be asked to give at least one entire day, to carry on an inspection of the mouths of school children. This is to be done under the authority of the Department of the Minister of Education.
2. A travelling Dental Clinic, carrying dental services to those very much in need, and working through the co-operation of the Provincial Department of Health and Provincial Red Cross, carrying on actual work in Out-post Hospitals of the above, one thousand dollars being set apart by the Council for this purpose.
3. To provide a travelling Dental Clinic to those in remote districts, who are entirely out of contact with dentists.

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These services to be paid for by the patient. An endeavour to be made to organize this work through Women's Institutes, Home Makers' Clubs, etc.

The Chairman for each section will call a meeting of all Dentists in his section, to present to them the plan of campaign, and have Committees appointed from each sectional group to carry out the campaign in each local community. He will also endeavour to interest all organizations from whom co-operation is desired, and to enthuse and inspire all dentists and laymen of the highly beneficial results accruing from such an educational campaign.

All assistance in providing speakers, literature, educational material, picture films, and limited financial assistance, will be available from the Dominion Headquarters of the Canadian Dental Hygiene Council, through the Central Provincial Committee in Regina, but each Chairman will be held responsible for the success of the programme in his district.

Chairmen have been appointed as follows:

Prince Albert	Dr. G. A. Robertson
North Battleford	" Walter G. Wilson, J. A. McIrwin
Tisdale	" H. Adams
Saskatoon	" Paul Winthrope, Dr. Ferguson
Humboldt	" J. C. King
Rosetown	" S. Moyer, M. J. McDonnell
Foam Lake	" R. H. Chant
Yorkton	" J. D. Brass
Grenfell	" C. D. Bricker
Regina	" A. J. Brett, J. D. Fasken, T. I. Robb
Moose Jaw	" R. H. McDougall
Swift Current	" G. L. Cameron
Maple Creek	" Stewart Kennedy
Estevan	" F. R. Graham
Assiniboia	" G. L. Kroshus
Weyburn	" Brimmacombe
Shaunavon	" J. E. Fraser.

A Central Committee of Regina Dentists will be appointed as a Province-wide Committee.

Co-operation asked for in campaign, and heartily granted, following interview with official heads of the following Departments:

Department of Health, Province of Saskatchewan, Hon. Dr. Urich, Minister of Health; Department of Education, Province of Saskatchewan, Hon. Mr. Latta, Minister of Education; Department of School Hygiene, Miss Ruby Simpson, Under Department of Education, Province of Saskatchewan; Provincial Red Cross, Mr. Marshall, Commissioner—Some equipment available; Junior Red Cross, Mr. Marshall; Provincial Department of Publicity, Mr. Kerr, Director; Saskat-

chewan Medical Society, Dr. Black, President; Saskatchewan Association Daily and Weekly Newspapers, Mr. Doran, Alameda, Secretary.

Under the co-operation of the Provincial Department of Health, and Provincial Department of Education, the Campaign is expected to embrace the interest of every organization for service, including:—The Provincial Red Cross, The Provincial Junior Red Cross, The Provincial Social Service Committee, The Provincial Mental Service Committee, The Provincial Tuberculosis Association, The Child Welfare Workers, The Big Brothers, The Big Sisters, The Boy Scouts, The Girl Guides, The School Teachers' Association, The Home and School Clubs, The National Council of Women, The Independent Order of the Daughters of the Empire, The Rotary, Kiwanis, Lions, Kinsman, Native Sons of Canada, Ecclectics, One Hundred Per Cent. Club, Progress, etc., The Dental Supply Houses, Dental Nurses.

A Note on Percussion as a Stimulus to the Growth of Bone*

BY MRS. LINDSAY, L.D.S., LONDON, ENGLAND.



IN the discussion following the paper in which Dr. Quintero described his ingenious method for dealing with incisors which were in faulty alignment, or which had lost the incisive edge through accident, and in consequence were not on a level with their neighbours, the question arose as to the liability of those teeth to return to their former position, and Dr. Quintero was questioned as to means whereby this danger of relapse might be obviated.

In conversation with Dr. Quintero after the meeting I suggested that percussion of the alveolus over the apex of the moved tooth might have the effect of stimulating new growth of bone in the socket, thus consolidating the position and rendering secure the result obtained.

This was not a haphazard suggestion, but was founded on a limited personal experience of the benefit of percussion in certain cases in practice; it was also supported by the record of a large number of clinical cases reported by H. O.

*Transactions of British Society for the Study of Orthodontics.

Thomas, the surgeon, whose name is associated with the Thomas splint, and who was one of the most experienced of the early orthopedic surgeons.

In a series of papers written by him in 1886 on the treatment of "Fractures and Dislocations," Thomas describes his treatment of cases of delayed repair and union of fractured bones by flagellating the surface over the seat of disunion with a copper-headed hammer padded with rubber.

Some of the ununited fractures thus treated were of long standing and had been previously treated by all the known methods, including wiring, rubbing the broken ends together, resection, etc. All attempts to effect union by these means had failed, yet success was attained when percussion was well and truly applied.

The case which, it appeared to me, bore most upon the present interest was that of a young girl whose patella slipped over the condyles of the femur, despite the fact that strong leather caps, firmly strapped, were employed to hold them in position.

Thomas hammered the surface over the condyles with moderate percussion every week for five months for the left patella, and during nine months for the right, and by this treatment alone induced a ridge of bone to form on each condyle, thus making it impossible for the tendons to slip. Recent studies in the growth of bone have shown that one of the most effective stimuli to growth is intermittent pressure.

When I was in practice, after finishing the movement in a regulation case it was my custom during the retention period to employ what I called "vibrant massage." This was carried out by means of the automatic gold plugging mallet used in the electric engine, with the largest plugging point padded with the India-rubber cork of a novocain tube. I was employing Thomas' percussion method without knowing it.

This proceeding I found efficacious as an aid in the treatment of teeth loosened by an inflammatory process such as stomatitis, pyorrhœa, etc. We may recall, in this connection, those cases not infrequently reported in dental journals, of the ultimate eruption of wisdom teeth or of canines in patients of advanced age, following on the insertion of artificial dentures.

I would suggest that this may be accounted for by the intermittent pressure consequent on mastication, stimulating growth of the alveolus and thus bringing about the eruption of

the tooth. I had for example, a girl of fourteen years of age brought to me for whom an unregistered practitioner had extracted a deciduous canine, and had thereafter inserted a plate bearing a single tooth, telling the mother of the girl that there was no permanent tooth present. The pressure of the plate acting on the alveolar bone stimulated renewed growth, which ultimately brought the retarded permanent canine into position.

I would suggest, therefore, that the method employed by H. O. Thomas, modified to suit dental conditions, might be employed with advantage to bring about certain orthodontic results such as:

1. Stimulating growth of alveolar bone around the roots of teeth which have been moved for purposes of regulation, and particularly in those cases in which a maxillary incisor has been brought down into alignment.

2. Hastening the eruption of retarded teeth, and generally for treatment of a stimulant and tonic nature applied to the gums in connection with orthodontic and other dental conditions. The method of applying this system of "vibratory massage" and of percussion can of course be varied in accordance with the ingenuity of the operator; an eccentric rotating point in the ordinary handpiece would produce the same effect.

If this communication seems trivial it has at least not taken up much time, and the fact that it has been submitted at all may be taken as an indication of the keenness of the Hon. Secretary as a snapper-up of unconsidered trifles.

Montreal Dental Assistants' Association



ENTHUSIASM and energy in carrying on their organization were the points stressed by Doctors Cameron and Dubeau in their addresses before the Montreal Dental Assistants' Association, at the meeting which was held in the new Medical Building on the occasion of the Association's first anniversary.

At the opening of the meeting, a vote of thanks was passed to Miss Ratner, the Secretary, for her untiring efforts on behalf of the Association.

Dr. Cameron, Professor of Prosthetic Dentistry at McGill, was introduced as the first speaker. Dr. Cameron expressed the hope that the meetings of the past year had proved bene-

ficial to the members, and urged them to attend those of the coming year in the proper frame of mind, which attitude, he stated, is enthusiasm. They should be eager to glean as much knowledge as possible from the meetings, and thus refresh their previously gained information, as well as acquiring new knowledge, which would keep them from getting into a rut.

Much valuable knowledge may be gleaned from the long study and research of the various dental practitioners who have addressed the Association during the year. Dr. Cameron compared this to an audience at a concert, enjoying the results of a noted pianist's long years of practice.

The members were urged to take their work seriously. Their work is in a great field, and they can greatly enhance their usefulness and ability by studying and increasing their knowledge. Dr. Cameron urged his audience to enter into the spirit of the meeting. He suggested that the Association follow the example of the American Dental Assistants' Association, by having the members themselves deliver essays at the meetings, and concluded with a final appeal to the members to be enthusiastic in their work, and wished them all possible success during the coming year.

Dr. Dubeau, Dean of the University of Montreal, then gave an address in French, followed by a few words in English. The keynote of Dr. Dubeau's speech also was enthusiasm and perseverance, especially in regard to the spreading of dental and oral hygiene.

Dr. Dubeau stated that all school children should have their teeth examined. This duty is sadly neglected in Montreal, there being only one dental inspector for over ninety thousand school children. He impressed on his hearers the fact that knowledge of dental and oral hygiene is bound to increase their efficiency, and concluded by tendering his best wishes for the continued success of the Association.

Following the addresses, some recitations were given, including one of Drummond's well-known Habitant poems, after which refreshments were served.

The election of officers for the coming year resulted as follows: Miss R. Firth, President; Miss E. A. McKee, First Vice-President; Miss J. Desjardins, Second Vice-President; Miss E. Voisey, English Secretary; Miss E. Gobeil, French Secretary; Miss E. Moye, Recording Secretary; and Miss M. MacLean, Treasurer.

The Necessity for Hermetically Sealed Fillings

DR. S. MILEFF.



SINCE the application of scientific methods to dentistry the latter has advanced little by little from the total empiricism in which it was formerly enveloped.

Dental caries, so often too lightly considered, is becoming recognized to be more important every day, yet in spite of considerable research the whole question is still far from clear. Its etiology is complex and comprises many different factors; the influence of heredity, of climate, nutrition, hygiene, age, general health, auto-intoxication and previous diseases has been recognized.

Although we are still in some perplexity as to the mode of action of these causes, the pathogeny of the condition is rather more clear. Since the investigations of Miller and Preiswerk it is generally admitted that the lesions of dental caries are formed in a chemico-parasitic manner. Opinions are divided as to the actual occurrences at the commencement of the destruction of dental tissue, but the role of the microbes can no longer be called in question. This fact being established, we may examine on what grounds the rational treatment of these lesions caused by micro-organisms should be based.

When one considers the conclusion of Pasteur, "If a field has been properly sterilized, and if it contain no germ, it remains continually the same without any trace of the production of new organisms," it seems certain that a carious cavity properly sterilized and protected against further microbic attack will remain indefinitely in the same condition. Therefore the treatment of these lesions should be to sterilize the part in question, and this done, to protect from any further bacterial infection.

Unfortunately, whatever be the method of sterilization employed, the practitioner can never be sure, by means of any laboratory test, that the remaining dental tissues are absolutely sterile; he can only presume it, taking care to make it as safe as possible, and await the clinical results which will justify him.

In this uncertainty it seems reasonable that the practitioner (considering the great difficulty of vigorous asepsis in dentistry)

should rather envisage the likelihood of certain organisms being present. Should he on this account condemn his work as hopeless? We do not think so, but he should attempt to arrange matters in such a way that the development of these bacteria, a real danger, shall be impossible. Can this be done? We think so.

Micro-organisms are unicellular forms of life to which we know from the work of Claude Bernard four conditions are indispensable. These are:—

- (1) A definite chemical compound, otherwise food.
- (2) Water.
- (3) Oxygen.
- (4) An appropriate degree of heat.

This being so, let us consider which of these conditions are to be found in a dental cavity.

(1) Food is represented by the protoplasm of Tomes fibres, the organic portion of the dentine, pulp tissue and blood in penetrating caries.

(2) Water is in the saliva, and protoplasm contains about 70 per cent. of it.

(3) Oxygen exists free in the buccal cavity, and in a combined form in the saliva and dental tissues.

(4) The correct temperature is furnished by the human body.

Eliminating this last, which we cannot alter, how may the other conditions be modified?

Food.—This being represented by the dental tissues, we may begin by removing the infected portions; then by acting upon the remainder with a penetrating antiseptic, coagulating the albuminoids and destroying the proteolytic ferments (in the case of penetrating caries), it is probable that the nourishment of the bacteria will be impaired.

Water.—The admission of water to the cavity may in the first place be prevented by isolating the latter from the saliva; the dental tissues may be dried with hot air. But the procedure does not end here. The cavity must be protected from the infiltration of water by means of an hermetically sealed filling, temporary or permanent. By hermetic we mean impervious to liquids and gases. In order that this result may be attained the filling material should be impermeable and adhesive so that no infiltration may occur between its walls and those of the cavity.

Oxygen.—As regards oxygen, we think that this may be excluded by such a filling as that mentioned above. The anærobic bacteria we believe will be suppressed both by the absence of humidity and the effect of the antiseptics on its foodstuffs.

In conclusion, in the treatment of dental caries we should be guided by two fundamental principles—absolute sterilization of the dental tissues, and the hermetic sealing of fillings, both temporary and permanent.—*La Semaine Dentaire and The Dental Record.*

Difficulties in Dental Practice



THE tooth is not an isolated thing, but in intimate solidarity with the great nerve and circulating centres upon which health and sensitiveness depend; the tooth is in direct or indirect relation with the tissues, or organs and cavities, all delicate and sensitive, of a vast importance; all teeth are of a distinct and particular shape with frequent anatomical and topographical anomalies and anomalies of direction. The tooth presents itself under various conditions, due to diseases or previous treatments, preventing a uniform and even plan being established for surgical operations; the local anæsthesia of the tooth requires a most minute technique in order to obtain the maximum result."

"The mouth is circumscribed by the throat, the cheeks, the tongue, and the front opening is from three to four centimetres, and in the cavity itself we have to struggle against the mobility of the tongue, the viscosity of the saliva, so much more plentiful because the secretion is increased by our manipulations—an overflowing saliva which masks and infects our operating field; against the cheeks and the lips, which, through their flabbiness, hinder considerably, and against the treatment, the uneasiness and the movements of the patients."

"The dental surgeon must carry out his small operations on organs of small size, of a complicated structure, or an exaggerated sensitiveness, amongst very vascular tissues, in septic surroundings; special conditions which all together seem to join forces in order to increase the difficulties and be like a stumbling block to the good result of his professional aspirations."—*Mr. Subirana in "Presse Dentaire."*



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*Provincial Editors will appreciate receiving from all local societies copies of
papers, society proceedings or personal notes, for publication.*



QUEBEC

SOCIETE DENTAIRE DE MONTREAL.



THE regular monthly meeting of the Société Dentaire de Montreal was held on Tuesday, October the 11th, 1927. The speaker was Dr. E. Dubeau, Dean of the Faculty of Dentistry, University of Montreal, who gave a paper on the "Federation Dentaire Internationale."

—P. G.



SOCIETE DE STOMATOLOGIE DE QUEBEC.



DINNER was held on Wednesday evening, October 12th, 1927, for dentists of Quebec City. The event of the meeting, which was held at Kerhulu Garden, was the election of officers of the Société de Stomatologie de Quebec. Dr. E. Beaulieu presided.

Election of officers resulted as follows: President, Dr. D. A. Déry; Vice-President, Dr. H. Lebon; Registrar-Treasurer, Dr. E. Bourdon; Secretary, Dr. J. Dallaire; Library Keeper, Dr. V. Plamondon; Executive, Dr. E. Blouin.

The last step of this meeting was the nomination of Com-

mittee for studying the report made by delegates of Montreal Dental Board, on organization of Dental Public Service in United States.

* * *

Two days later, 14th October, a special meeting was called at the Chateau Frontenac Hotel, at which Dr. D. A. Dery presided.

A delegate of Montreal Dental Board, Dr. J. Nolin, gave the reading of the report regarding different organizations of Dental Public Service in United States. The meeting decided to co-operate with Dental Board and Universities to get from Provincial Government the institution of Dental Hygiene Service in Province of Quebec. There was, however, a unanimous vote raised against the use of Dental Hygienist Nurses in Dental Public Service.

—J. DALLAIRE.

* * *

ONTARIO.

CASE REPORT FROM OTTAWA DENTIST.

“ HAD in my own family a very illuminating experience with focal infection. My wife hasn't been altogether well for several years, and in June developed sciatica, which kept her in bed for two months, and became so acute that we had to put her in the hospital with a special nurse day and night; kept her under morphia for days, used violet-ray, physio-therapy, dry heat, vaccine, etc. They took a culture from the tonsil stumps (she had them snared off years ago), found streptococcus haemolyticus, and blamed it on the tonsils; took a blood culture and grew only streptococcus haemolyticus. Then I began to insist on teeth. Took some x-rays at the hospital and the M.D. in charge of that department condemned three teeth. I condemned three more; we had them removed, cultures taken from sockets and from the roots ground up in a sand bath, and found streptococcus haemolyticus in each case. The pain stopped the following day, but she had a flare-up three days later which lasted for three days. It then cleared up and now she is better in health and spirits than she has been for years.

"From a scientific point of view the most interesting thing is that a week after the removal of the teeth a mandibular bicuspid, vital by ordinary tests, by the pulp tester, with only a small filling in it, and perfectly normal by the radiogram, became very sore. It was removed and had on the end of the root a granuloma.

"No doubt its vitality was low and the releasing of so many organisms by the extraction of the others infected it.

"It is again a case of the 'shoemaker's children going barefooted.' These teeth were first and second molars devitalized when she was a child and had given no discomfort; she has beautiful teeth, has spent very little time in my chair and had consistently refused to submit to a radiographic examination because she said I would immediately start extracting. Just another little sidelight on human nature and a proof that a fellow can be so close to the woods that he can't see the trees!"

—S. G. McC.

* * *

 R. A. D. A. Mason was the essayist at the October meeting of the Ottawa Dental Society, the subject being "Diagnosis." Dr. Dormer gave a resume of the Periodontia Division, practitioners' course at the Faculty of Dentistry of the University of Toronto.

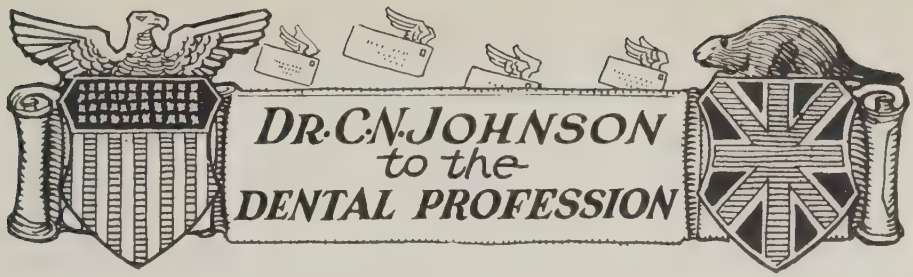
* * *

Congratulations are in order for Dr. Milton Armstrong, who made an ace at the eleventh hole at a play-off on the Kanawiki Golf course in Montreal.

* * *

ELGIN DENTAL ASSOCIATION.

 HE officers of the Elgin Dental Association for the coming year were elected at an enthusiastic meeting of the Society and are as follows: President, Dr. W. J. Riseborough, 374 Talbot St., St. Thomas, Ont.; Vice-Pres., Dr. J. D. Clark, Aylmer, Ont.; Sec.-Treas., Dr. Glenn T. Mitton, 675 Talbot St., St. Thomas, Ont.



❖ ❖ ❖ ❖
When I Go Down

*I want to go when the waves leap high,
When the whitecaps snarl at the sullen sky;
When the breakers boom on the rocky shore,
And the storm howls loud like the lion's roar.*

*I want to go when the ship strains hard,
When the spray beats high over mast and yard;
I want to go when the timbers crack,
With the waters wild and the heavens black.*

*I want to go when the fight fares fast,
When the cannons roar with the loudest blast;
I want to go when the bayonets flash,
I want to go when the sabres crash.*

*I want to go when the tempest moans,
When the air is thick and the forest groans;
I want to go when the wild woods rage,
When the sand beats hard on the desert sage.*

*I want to go when the torrents tear
Down cliff and crag, high up in air;
I want to go when the thunders peal,
When the lightnings dart like streaks of steel.*

*I want to go when the earthquake heaves,
When the cyclone fills the air with leaves;
When the frost king gleams, and the swirling snow
Clothes hill and vale, I want to go.*

*I want to go when the pulse runs strong,
When the head is high and the breath is long;
I want to go when the eye is bright,
When the heart is young and full of fight.*

*I want to go when the summer sun
Shines full in the face of deeds well done;
I want to go ere life grows tame,
I want to go while I play the game.*

C. N. J.

Oral Health

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EDITORIAL

Uniformity of Dental Standards in Canada



AT the Eleventh National Conference of Canadian Universities held at the University of Western Ontario, London, in June last, a resolution, moved by President Tory of the University of Alberta, and seconded by President McLean of the University of Manitoba, was carried unanimously, approving the one-five or, its equivalent, the two-four course of study as a minimum preparation for the practice of Dentistry. This preprofessional standard is in effect the same as required for the practice of Medicine and there appears to be fairly unanimous opinion throughout the dental profession, as well as the universities of Canada, that these higher dental standards, as adopted by New

York State and other American universities, should prevail throughout the Dominion of Canada.

The adoption of such requirements would bring about a uniformity in Canadian dental standards that would result in closer co-operation among the several provinces and place the Dominion Dental Council upon a much more satisfactory basis.

Oral Hygiene in Saskatchewan

HE Canadian Dental Hygiene Council and the dental profession of the Province of Saskatchewan are to be congratulated upon their co-operative plan to organize a Public Dental Health Campaign throughout Saskatchewan early in the new year.

It will be remembered that both the Dominion Government and the Canadian Red Cross made substantial grants to the Canadian Dental Hygiene Council and it is now proposed to spend upwards of \$3,000 in an intensive campaign in Saskatchewan where the members of the profession have given every assurance of cordial co-operation.

Testimonial Dinner to Dr. W. D. Tracey

TESTIMONIAL Dinner is to be tendered to Dr. William Dwight Tracey, under the auspices of the First District Dental Society of New York, in recognition of his valuable and untiring efforts for the advancement of the dental profession, on Tuesday evening, December 6th, 1927, at seven o'clock, Hotel Pennsylvania, New York City.

Dominion Dental Council Examination Results—September, 1927

THE following have passed the Dominion Dental Council examinations on the following subjects, as indicated:

Anatomy.—Buffett, L. R.; Cragg, T. E.; Dewis, G. M.; Graves, J. H.; Hill, D. J.; Levinson, K. I.; Millar, F. L.; Miller, J. P.; MacLean, J. D.; Robson, J. W.; Sullivan, C. A.; Sutherland, G. D.; Zakus, P.

Histology (only).—Buffett, L. R.; Burskin, J. A.; Craig, M. L.; Graves, J. H.

Anæsthetics.—Findlay, C. A.; Graves, J. H.; Leith, A.; McBrien, J. M.; Powell, H. B.; Sutherland, G. D.

Pathology and Bacteriology.—Adam, S. R.; Corlett, H. M.; Dewis, G. M.; Findlay, C. A.; Godsoe, W. H.; Gowda, Faust; Graves, J. H.; Leith, A.; Lesik, J. I.; Miller, J. P.; Powell, H. B.; Sutherland, G. D.; Tupper, J. A.

Physiology and Histology.—Cragg, T. E.; Leith, A.; Millar, F. L.; Oldfield, S. R.; Sutherland, G. D.

Physiology (only).—Langstroth, R. S.

Orthodontia Jurisprudence and Ethics.—Corlett, H. M.; Findlay, C. A.; Graves, J. H.; Sutherland, G. D.

Materia Medica and Therapeutics.—Adams, S. R.; Dewis, G. M.; Graves, J. H.; Langstroth, R. S.; Miller, J. P.; McBrien, J. M.; Sutherland, G. D.; Tupper, J. A.; Washington, L. A.

Physics and Metallurgy (only).—Adams, S. R.

Medicine, Surgery and Radiology.—Gowda, Faust; Lesik, J. I.; Sutherland, L. D.

Physics, Chemistry and Metallurgy.—Anderson, P. G.; Buffett, L. R.; Clark, H. E.; Cragg, T. E.; Graves, J. H.; Langstroth, R. S.; Millar, F. L.; McBrien, J. M.; Oldfield, S. R.; Robson, J. W.; Sullivan, C. A.; Sutherland, L. D.; Washington, L. A.; Zakus, P.

Obituary

HOLMES C. JACKSON, DEAN OF NEW YORK UNIVERSITY
COLLEGE OF DENTISTRY, DIED OCTOBER 25, 1927.



HOLMES C. JACKSON, Dean of New York University College of Dentistry, died Tuesday morning, October 25, 1927, in New York City, after an illness of many months. Dean Jackson, who was 52 years old, was born in New York, February 18, 1875. He received a Ph.B. degree from the Sheffield Scientific School (Yale) in 1896; the following three years were spent in the same school, from which he received a Ph.D. degree in 1899. Two years of study at Strassburg and Berne ensued.

His connection with the New York University commenced in September, 1901, when he began as instructor in the University and Bellevue Hospital Medical College. From 1905 to 1909 he was with the Albany Medical College, working in the field of experimental physiology and director of the laboratories concerning Physiological Chemistry and Supermental Physiology.

Again in 1909 he returned to New York University and Bellevue Hospital Medical College as Professor of Physiology, and later became Assistant Dean there.

When New York University took over the New York College of Dentistry and reorganized the entire school into the New York University Dental College in 1925, Dr. Jackson was selected for its first Dean.

The Arrow and the Song

I shot an arrow in the air,
It fell to earth, I knew not where;
For, so swiftly it flew, the sight
Could not follow it in its flight.

I breathed a song into the air,
It fell to earth, I knew not where;
For who has sight so keen and strong
That it can follow the flight of song?

Long, long afterward, in an oak,
I found the arrow, still unbroke;
And the song, from beginning to end,
I found again in the heart of a friend.

—*Longfellow*



DOCTOR GEORGE FREDERICK CLARKE.
Woodstock, N.B.

ORAL HEALTH

*A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION" AS WELL AS THE "POUND OF CURE"*



Vol. 17 TORONTO, DECEMBER, 1927 No. 12

Partial Denture Service—An Outline*

W. E. CUMMER, D.D.S., F.A.C.D., TORONTO.

Professor Prosthetic Dentistry, University of Toronto.



STUDY of the outline of the main essentials of Partial Denture Service as presented in the analysis which follows, will assist the reader toward a conception of Dentistry not generally recognized at the present time, namely, that Dentistry, as a Health Service, employs not only that science and practice essentially her own, but that she also borrows and adapts portions from Medicine, Surgery, the fine Arts, and from Engineering, along with its vast technology. The obvious differences between Engineering in an ordinary sense, and as applied to the mouth, are first, that the biological laws which apply to the living oral parts which are concerned, govern the application of the engineering principles involved in the work to be done; or, in other words, the work done, or the appliance made for the patient, must function *with* and preserve the health of the living parts; and second, that their application is within the comparatively small spaces found in the mouth. Hence, in Prosthetic Dentistry, engineering principles are used in restoring and maintaining oral health and are, therefore, in a very real sense, therapeutic measures. Like any technical service, there are two sides, namely the Science, or classified knowledge, and the Practice, or the arts involved in actually doing the work.

THE SCIENCE.

Referring to the analysis which follows, ** the need for

* A summary of a lecture-demonstration prepared for the Ontario-Durham Dental Society, under the Extra-Mural Plan of the Faculty of Dentistry, University of Toronto.

** Pages 694-5-6.

the first of the three divisions, namely a working knowledge of the normal oral structures and functions, is obvious; and for the second, namely the care of these from injury, is also evident. Injuries resulting from a lack of prosthetic service should be made known to the patient; while injuries resulting from faulty prosthetic service should be well known to the dentist.

Regarding the third division, and in view of the immense value of standardization in modern life, which makes many manufactured articles (both of necessity and of luxury) possible for the public at the present time, an effort toward standardization is here made, with the hope of making Partial Denture Service available to a greater number of persons who require it. This is undertaken here by, among other things, outlining for the dentist six groups of standard parts, including all that are necessary, save for extraordinary cases, of which he must have a working knowledge,—and which will be incorporated, as required, into the proposed partial denture during Design.

THE PRACTICE.

The working knowledge acquired in the study of the Science serves to govern the subsequent procedures during the Practice of Partial Denture Service.

The Preliminary Examination is essential for the success of the subsequent service. Five of the most important headings are here submitted.

The Design, including the Plan and Elevations of the proposed Partial Denture, preceded by the Preliminary examination, are both essential for the success of the subsequent service. The writer recommends a graphic method for more difficult cases, in which the Plan (a view from above or below) may be drawn upon a printed arch of fourteen teeth in four stages as indicated above, followed by a Revision.

After an experience of ten years' use, the writer recommends this system of practical value in arriving at a scientific and practical plan for any case which may present. The division of the work of developing the design into four successive stages, arranged in logical order, permits concentrated thought without undue effort and without confusion of ideas, upon each stage of the design, which appears, almost as by magic, at the point of the pencil. At the end of the second stage, at which retention is considered, a complete picture of

the denture outline appears before the dentist, permitting him to choose the most suitable two teeth for this purpose (or three if necessary) with ease and certainty.

Where there are two or more similar outlines, or arrangements for retention or support, or of any other details growing out of the stages in design of the same case, each of these should be carried to completion, the finished designs compared, and the most suitable one chosen.

The Revision applies more particularly to those partial dentures which move perceptibly during function. A mucosa-supported denture will tend to move in the general direction of the occlusion at central occlusion; while a tooth-mucosa-supported denture will rotate within the small but significant limits of the compressibility of the mucosa and sub-jacent tissues. A search must then be made to discover and eliminate any rigid part which would interfere with these motions, and thus react injuriously against the natural teeth in a direction not parallel with their long axes.

Other details, which would not appear upon a Plan but would appear upon Elevations (views from the sides), require articulated study casts in cases involving the prosthetic treatment of malocclusion, such as, for example, "opening the bite." On the other hand, simple cases may be designed mentally, the number of which increases as the dentist's experience grows in this work.

Should co-operation with laboratory assistants remote from the dentist be desirable, Specifications may also be necessary.

At all times there should be a constant lookout (especially in mucosa, or tooth-mucosa-supported partial dentures, which move perceptibly during function) for structural parts which may cause any of the injuries as listed under the head of Injuries from Faulty Prosthetic Service. (Sec. B Science).

The Construction should not be commenced until the Design (based upon the Preliminary Examination) is completed.

Accuracy *within the requirements of function* is probably the first essential. Because tooth-supported partial dentures are practically immobile during function; and mucosa and also tooth-mucosa supported restorations move perceptibly, a differentiation of impression methods seems advisable; so that tooth-supported dentures are taken in plaster under zero pressure, while the mucosa and tooth-mucosa supported dentures are taken with the saddle areas in modelling compound, and under

PARTIAL DENTURE SERVICE—A BIO-ENGINEERING PROBLEM.

An Analysis Including Some of the Principal Features.

(considered for persons of moderate income, but subject to modification above or below this standard)

THE SCIENCE OF PARTIAL DENTURE SERVICE. A Working Knowledge of:—

(A). The Structure and Function of the Parts Concerned (Gross and Minute).
(B). The Care of these Structures and Functions.

- (1) From the Causes of the Loss of Teeth
- (2) From the Effects of the Loss of Teeth

(a) Injuries from a Lack of Prosthetic Service

1. Malocclusion

2. Increased Stress and Wear

(b) Injuries from Faulty Prosthetic Service

1. Caries
2. Gingival Trauma
3. Overload (Teeth or Mucosa)
4. Torque
5. Incline Plane
6. Lateral Thrust

(C). The Standard Parts

Which, if properly chosen and brought together during the Design of the partial denture, will
(1) Restore lost structure and function, and (2) Care for the remaining structure and function

(1) Base

(a) Skeleton

(b) Non-Skeleton, (for greater saddle area or adhesion)

(2) Attachment (Joining teeth to base)

(3) Teeth, artificial

(4) Retainers (a) Direct

(i) Precision (interlocking devices)

(ii) Non-Precision

(a) Adhesion

(b) Clasp (1-2-3 Arm), Mesio Distal, Bucco-Lingual or Line Angle

(c) Crib (single or multiple)

(d) Interlocking devices

(b) Indirect

(5) Connectors

(a) Rigid

(b) Semi rigid } called stress-breakers

(c) Flexible }

(6) Occlusal Rests, (directing loads of mastication along the long axes of the natural teeth used).

THE PRACTICE OF PARTIAL DENTURE SERVICE

(Preferably in collaboration with the physician, surgeon, radiographer, diagnostician, periodontist, orthodontist, exodontist or others, if required.)

(A) Preliminary

- (1) An examination, with radiographs, study casts, photographs, and other records, as necessary.
- (2) Diagnosis and cure of disease.
- (3) Re-alignment of remaining natural teeth.
- (4) Study of type of mentality of patient.
- (5) Choice of appliance, full, partial or bridge. (If in doubt design each and compare.)

(B) Design

- (1) (either mental or on paper and with or without Specification).
- (2) Saddles (Giving load to Mucosa)
- (3) Parts joining saddles (giving load to Mucosa.)
 - (a) Upper, between rugæ
 - (b) Upper, between molars
 - (c) Lower, at line of peripheral seal.
- (4) Retention
 - (a) Two retainers, **Fulcrum Line** in middle of denture outline. If this is not possible:—
 - (b) Three retainers, **Fulcrum Triangle** or **rhombus** superimposing, if possible, outline of denture.
 - (c) Clasp design (if clasps are included)
 - (i) Guide Line
 - (ii) Arms of Clasp, Located on Guide Line
 - (iii) Body of Clasp, located on Guide Line, beneath a sloping surface.
- (5) Occlusal Rests, if needed, (Giving load to teeth with **Rotation Line** to one side of the denture outline (in tooth-mucosa supported cases only).
- (6) Connectors (rigid, giving load to Teeth:—flexible, to Mucosa)
 - (a) Revision of Design—suggested heads
 - (b) Revision of base areas, to avoid caries, gingival trauma and overload of mucosa.
 - (c) Revision for forces on teeth not parallel with their long axes, as Torque and Incline plane.
 - (d) Lateral rests for side thrusts if needed
 - (e) Clasps, or supports for weak teeth if needed
 - (f) Provision for substitute anchor teeth if needed, in case of loss

(C) Construction (not to be commenced until the Design is completed.)

- (1) Impressions
 - (a) For tooth-supported restorations
 - (b) For Mucosa and Tooth-Mucosa supported Restorations. **A proposed technique on basis similar to the full denture technique follows:**
- (2) Framework construction, and inspection in mouth (for forces not parallel with long axes of remaining teeth).
- (3) Registry of Mandibular movements and occlusion (using framework for bite blocks)
- (4) Esthetics
- (5) Final try-in and finish.
- (D) **Installation** or insertion of denture (including spot grinding or adjustment until satisfactory)
- (E) **Maintenance** (both of natural and artificial parts) and **Repair**, including full case records.

PARTIAL DENTURE SERVICE—A BIO-ENGINEERING PROBLEM.

An Analysis Including Some of the Principal Features (Continued).

A PROPOSED IMPRESSION (PRIMO-SECONDARY) TECHNIQUE FOR MUCOSA AND FOR TOOTH-MUCOSA SUPPORTED PARTIAL DENTURES.

(approaching as nearly as possible full denture impression technique. Reference, *Cosmos*, September 1926, December, 1927, and January and February, 1928.)

Step 1. **The Dentist** will select stock tray, take an approximate impression, have study cast made and complete the design of the denture. If Mucosa or Tooth-Mucosa support is chosen:—

Step 2. **The Assistant** will

- (a) Outline a tray on study cast as for a full denture, with a pencil, but with the undercuts (teeth or alveolus) exposed.
- (b) Make wax pattern and mould it in calcar; then cast the tray in commercial tin. (442°F.)

Step 3. **The Dentist and the Assistant** will

- (a) Make a thin primary impression (also exposing all undercuts) with the tin tray, using stick compound.
- (b) While the primary impression is held in the mouth under a light biting stress, make the secondary impression of the undercuts in the exposed teeth and alveolus in plaster (using small trays or syringe with or without vanes):—or modelling compound sections, keeping up the stress till the secondary impressions are hard; then, releasing this pressure.
- (c) Remove the secondary impression by either lifting out vane or cutting the plaster; or, if in compound, by removing the sections.

Step 4. **The Assistant** will re-assemble and box the impression and make the casts, using an all plaster or stone construction, or amalgam or low fusing metal for the teeth, as desired by the dentist. Should an all-metal model be desired, the primary impression in Step 3 will be of plaster.

NOTE.—For the reason of unusual size in mouths with or without teeth, or for any other reason, the wax pattern for the tray in Steps 2 and 3 may be made directly in the mouth without a study cast, from which the tray is then made.

light biting stress, during which the teeth are taken in plaster, which supplies a cast with the teeth in relation to the mucosa under this same light biting stress. It is hoped that much of the present rebasing will be eliminated by this technique.

Hence, for tooth-supported partial dentures a one-piece plaster impression, or preferably a sectional plaster impression, as demonstrated by such men as Dr. M. B. Rudd, of Richmond, Va., and latterly by Dr. F. E. Roach, of Chicago, Ill., approaches close to the ideal, according to present day standards.

As for impressions for tooth-mucosa and mucosa supported partial dentures, a proposed method in two stages is here * outlined, the first or primary impression which is similar to ordinary full denture modelling compound technique, except that all undercuts about the teeth or alveolus remain uncovered; and while this primary impression is held in the mouth under light biting stress, the secondary impression or impressions of the teeth and other undercuts are taken in plaster.

All vulcanite (including the newer phenol-base materials) construction is desirable only, as a rule, when costs must be reduced to an extreme minimum; or in unusually large restorations such as following maxillary resection, accidents or surgery involving large losses of teeth, or under similar conditions.

Combined metal and vulcanite are specially desirable when rebasing is necessary (particularly after recent extractions). One-piece castings (if accurate and otherwise satisfactory) seem particularly suitable for tooth-supported cases, in which the comparative lack of mobility does not call for a particular degree of resilience in those parts, notably the clasps, which come in contact with the remaining teeth; while in tooth-supported and tooth-mucosa supported cases in which an added resiliency is necessary for these members in order to avoid trauma, a casting of all save the clasps, flexible connectors, or similar members requiring resiliency is made (which will permit movement without trauma and which are preferably made from rolled or drawn material, swaged or bent to freehand form) to which the casting is subsequently united by solder. The framework should be periodically inspected for accuracy, adequate retention, unhampered movement, (and consequent absence of trauma to the remaining teeth) until its completion;

* P. 696.

and then it becomes a highly suitable structure upon which to erect the biting blocks.

For no class of prosthetic work is there a greater need for mandibular measurements and their reproduction upon an adjustable articulator (both accurate within the limits of function) and the intelligent selection and arrangement of artificial teeth. In full denture work, faulty articulation with cusp trauma is reflected against the peripheral border of the dentures, but in partial denture work this is reflected against the remaining teeth, often to their destruction.

In the writer's opinion, an incisor guide with a range of movement in three dimensions, such as that of Sears, is desirable in all cases and quite necessary in many partial denture cases. The presence of remaining natural teeth, essential for the success of the partial denture, often deformed and out of normal position, complicates the placing of the artificial teeth for balanced occlusion,—a difficulty not encountered in full denture work, which also, as in full denture work, may be facilitated by the use of the Hanau quint, which expresses the laws of articulation involved in convenient form for practical use.

In replacing lost anterior teeth, the problem of esthetics becomes in a sense also more involved, as it is often necessary to imitate the characteristic peculiarities in colour and form of the fellow on the opposite side of the mouth of the missing tooth. These peculiarities, such as tobacco stains, or white spots, pits or cracks in the enamel, in addition to various deformities for example, as for wear, will occasionally tax the resources of the dentist to the utmost.

The Final Try-in. After the construction has been completed, and while the teeth are mounted in wax upon the base, it is wise to place the restoration in the mouth at this time for the inspection of the patient, when alterations may readily be made. The patient's reaction, secured at this time, may prevent misunderstanding and occasionally the necessity for reconstruction.

The Installation or Insertion of the Partial Dentures may not be overlooked, for it is conceivable that a well-designed and constructed partial denture may fail if it is not carefully installed.

Minor distortions, due to soldering, casting, or vulcanizing, or from other causes, may here be corrected by spot grinding

in the mouth, or if the restoration approaches full dentures in extent, may be replaced in the articulator and ground-in with carborundum grains in glycerine or similar medium.

The service is not complete until all settling has been provided for by rebasing, and all other adjustments are made, and the dentures function effectively without trauma.

Maintenance and Repair are occasionally necessary in a standardized manufactured product which (as, for example, a watch) has built into it the findings of centuries of study and progress in that particular branch of technology.

It is therefore reasonable that patients wearing partial dentures in each case specially designed and constructed, and functioning with living parts, should be subject to an occasional oral examination, more especially those wearing partial dentures of unusual design.

Pyorrhoea Alveolaris

A Critical Review of the Text on Pyorrhoea Alveolaris by F. St. J. Steadman, M.R.C.S., L.D.S., England.

C. ALVIN SNELL, D.D.S., TORONTO.

*Associate Professor of Periodontology, Faculty of Dentistry,
University of Toronto.*



HIS review is not written in any spirit of carping criticism. The author's contribution to this subject has been studied with much interest, but with profound disappointment that he has but little to offer of a constructive character. The book shows ample evidence that he has given considerable thought to the subject. He has a comprehensive grasp of the pathological conditions involved, and the presentation of his material is splendidly and abundantly illustrated. But in the matter of treatment he is most pessimistic, and in this respect his conception of the subject is most inadequate. The dental student who is seeking help in the management of periodontal disease would be inclined to throw up his hands in despair.

The author clings to the old term Pyorrhœa Alveolaris.

Seeing that it literally means "a discharge of pus from the alveolus" he admits its inadequacy, but concludes that on the whole it is as good as any other.

Dealing with the subject as he does from the medical point of view, he very rightly stresses the prevalence of the disease, and presents some very graphic pictures of physical disability resulting from oral sepsis. Quite one-third of the book is devoted to a discussion of the relationship of oral sepsis to systemic complications. This forms a valuable feature of the author's contribution to this subject.

He divides periodontal diseases into three types:—

1. Germ Carbohydrate.
2. Atrophic.
3. Acute Infective.

To discuss these in detail we may first deal with the third type, as this is in a class by itself, for by it the author means the so-called Trench Mouth, which has been given a variety of names, and which differs from the other forms of periodontal disease in that it is purely the result of an infection of the gingival tissues by two specific organisms found in symbiosis, Vincent's Spirochæte and the Fusiform Bacillus. Dr. Steadman is in error when he says that it is "due to an infection of the periodontal membrane by Vincent's organism," as the periodontal membrane is but seldom involved, the infection commencing as it does in the gingival tissues, and being as a rule confined to them. While various drugs have been advocated in the treatment of this infection the author pins his faith to the use of pure phenol, swabbing the ulcerated areas every day with the phenol for several days, or until the ulcerations have disappeared, after which the scaling of the teeth may be begun, this being the one type of periodontal disease in the treatment of which drugs play an essential part. The author fails, however, to recognize that gingival flaps overlying partially erupted third molars often act as incubating zones for this infection, since they offer an ideal culture medium for the growth of the anærobic bacteria responsible for the trouble. It is thus necessary if recurrence of the infection is to be avoided to rid the mouth of such incubating zones either by resection of the gingival flaps or the extraction of the offending teeth.

The Germ Carbohydrate type is so designated because the inflammatory reactions noted are due to bacterial action on soft food debris lodging at the gingival margin. This cor-

responds to the Periodontitis Simplex of Box, in which type the gingival signs are most prominent, the pocket formation being shallow and of slow progression, and with little or no mobility of the teeth. When "Pyorrhœa" has been spoken of by some writers as a "filth" disease, it is this type which they have had under observation.

Far more serious and insidious, however, is the diseased condition referred to by Dr. Steadman as the Atrophic type. This corresponds to the Periodontitis Complex of Box, which is characterized by deep and narrow pockets, with mobility generally pronounced especially in the later stages. The author very correctly observes that this is the type frequently overlooked by the medical profession, and he might have added with equal truth, by the dental profession as well. This is due to the fact that the gingival signs are either insignificant or may be entirely lacking. As he points out, it is difficult for anyone without special training to realize that a serious condition can exist in a mouth which to casual observation appears healthy. This type begins by degenerative changes in the pericemental membrane and atrophy of the alveolar process. Herein lies its insidious character, and here also is found the explanation of the well known fact that it is so frequently unrecognized until great destruction of the supporting tissues has occurred.

Coming to the question of treatment it is most unfortunate that Dr. Steadman has found it necessary to be so pessimistic. On page 20 he says, "It appears in the present state of our knowledge extremely doubtful if we can repair a periodontal ligament, and the only remedy appears to be the extraction of the tooth." Again on page 36 he says, "With regard to the healing of pockets, and the reattachment of soft tissue to the cementum, my clinical experience is that it is possible to bring this about in young people in some cases by careful cleansing of the pocket, the removal of calculi, and by ionization, but when the pocket has been present for some considerable time, I share the pessimism of the majority of writers." Again on page 229 he further says, "Moreover, conservative treatment, such as ionization and similar measures, have very little if any power in arresting the progress of the disease. If general symptoms arise, prompt and complete extraction of all the affected teeth is a wise course in most cases."

It is perhaps scarcely necessary to say that this pessimistic

attitude does not apply to the Acute Infection type, which he finds quite curable.

It is the Atrophic type to which he particularly refers. It is quite astounding, however, to find that even with the Germ-Carbohydrate type he has this to say, in speaking of the treatment of the disease in childhood, "If the margins of the gums are swollen, and pockets have commenced to form, the gum margin should be excised, and the pockets freely laid open, followed by a course in ionization. If the gingivitis still remains intractable treatment by ultra-violet radiation will often materially assist these cases." The astonishing thing is that he should ever find this type of periodontal disease intractable. While quite admitting the greater skill required in dealing with the Atrophic type it should be fairly obvious that as far as the Germ-Carbohydrate type is concerned the most important line of attack consists simply of strict oral hygiene. It would appear that the author is unfamiliar with a method of brushing which will enable the patient to remove bacterial plaques from the teeth, and at the same time so stimulate the gingival tissues as to increase their power of resistance to bacterial invasion. Such brushing has been adequately described by Charters, Stillman, Hartzell and others. When the dentist by thorough scaling and polishing, and correction of the occlusion where this is indicated, has by his efforts placed the mouth in a condition where the patient can most effectively do his part, then it is quite the consensus of opinion by periodontists on this continent that granted the patient will master the art of correct brushing no case will be found intractable. And, further, it is quite certain that ionization and ultra-violet radiation become utterly superfluous proceedings.

Coming now to the treatment of the so called Atrophic type, in which degenerative changes in the pericementum and rarefaction of the alveolar process constitute the initial lesions, it is most regrettable that Dr. Steadman has found it necessary to be so pessimistic. He regards the prognosis as utterly unfavourable, and as evidenced by the quotations previously given has but little to offer except resection of the gingival tissues and early extraction, and it is quite evident that such measures are but admission of failure. Such an unfortunate attitude on the part of one who has very evidently given considerable thought to the subject seems quite astonishing to periodontists on this continent. It is not within the scope of

this review to give in detail a description of case management, but it can most emphatically be stated that we do not share in the pessimism of Dr. Steadman. The teaching of the Faculty of Dentistry of the University of Toronto is that reattachment of the soft tissue to the root surface is possible wherever this prognosis is favourable. Knowing that this can be done, and is daily being accomplished by periodontists who have acquired the necessary knowledge and skill, it becomes the duty of every one attempting to treat periodontal lesions to endeavour to bring about such a result. It is quite beside the point for Dr. Steadman to say that it is "extremely doubtful if we can repair a periodontal ligament," for the simple reason that no such repair is expected. In pocket formation the pericemental membrane is destroyed, and so when reattachment has taken place the tissues are histologically different from the condition prevailing prior to pocket formation. The new attachment is one of fibrous connective tissue in which the fibres run parallel to the tooth surface. Nevertheless in spite of the histological differences we consider that a genuine reattachment has been secured. Inability to pass a probe between the soft tissue and the tooth to a greater distance than the normal gingival crevice affords ample evidence of a successful result. Clinical experience also establishes the fact that with the continued co-operation of the patient, combined with such prophylactic treatment as the case demands, the good condition can be maintained. Thus we find that we differ most radically with Dr. Steadman in our conception of what can be accomplished by present day methods of dealing with periodontal disease.

Under the heading of "Preventive Treatment of Pyorrhœa" a considerable space in the book is devoted to the advisability of removing certain teeth in over-crowded arches in the mouths of children, the object being the prevention of congestion which might otherwise be found associated with markedly irregular teeth. Profuse illustrations would indicate that apparently beneficial results have been secured by judicious extraction. One is impressed by the amount of material which the author presents in order to prove his case. We decidedly disagree, however, with the position taken by Mr. J. G. Turner, which is quoted with apparent approval by the author on page 198, when he "advocates extraction of the first permanent molars at the age of between fourteen and sixteen in order to bring

about spacing of the teeth." Such spacing would, in our opinion, in the majority of cases, result in such drifting and tipping of the teeth as to inevitably bring about the very condition which he is seeking to prevent. It is common knowledge that with the tipping forward of the second molars under such conditions that "pyorrhœa" pockets develop on the mesial aspect of these teeth, because of wrongly directed occlusal stress. Indeed the author himself supports this contention when he says on page 19, "The condition known as Traumatic occlusion occurs in cases where, owing to loss of one or more teeth or to malocclusion, an undue stress is placed upon certain teeth, subjecting them to trauma during mastication, which in turn leads to changes in and definite damage to the periodontal membrane, thus predisposing to infection with the formation of pockets and serumal tartar, and eventually to the destruction of the periodontal ligament with the formation of pockets." He has thus himself painted a sufficiently graphic picture of what may be expected when the integrity of the arch is destroyed as to render unnecessary any further criticism of his advocacy of extraction as a preventative of periodontal disease.

We find it necessary to criticize Dr. Steadman's order of procedure in the matter of treatment when he says on page 232, "If teeth are to be saved in cases of periodontal disease, the first essential is a thorough and complete removal of every particle of tartar, especially the hard serumal tartar." We submit that it would be more scientific, and would be an evidence of a better understanding of the etiological factors involved to make a statement in some such manner as follows: If teeth are to be saved it is essential to recognize that a combination of factors is usually responsible for the production of periodical disease. If the case is a Germ-Carbohydrate type it is obvious that such measures should be adopted as are necessary to secure and maintain a hygienic condition of the mouth. If, however, the case has been diagnosed as the Atrophic type, being one in which a traumatizing occlusion has been responsible for initiating degenerative changes in the pericemental membrane, accompanied by rarefaction of the alveolar process, with the subsequent formation of pockets because of the infective factor which has been superimposed on the deeper and initial lesions, then it is obvious that the correction of the occlusal factor is the first procedure to be undertaken in the treatment of the disease. If this step should

be neglected or postponed a depressing factor would still be operating which would militate against successful results. Following such correction the attention should next be directed to the matter of instrumentation, and the securing of the patient's earnest co-operation by means of such methods of brushing as have been definitely proven to be of inestimable value in controlling periodontal disease.

One does not wish to be hypercritical, but on page 28 there occurs a phrase which can scarcely be allowed to pass unnoticed, namely, "gingivitis of the gums." One might just as justifiably say, "appendicitis of the appendix."

It can very definitely be stated that Dr. Steadman greatly underestimates the value of correct brushing. He says on page 235 that "if a large portion of the interdental papillæ is removed, although the teeth may be rendered moderately healthy for a time, soft food will inevitably lodge in the V-shaped spaces which are left between the teeth and the gum margin, and the recurrence of the disease sooner or later is inevitable." This view is entirely contrary to our clinical experience, which shows that the patients can be taught to maintain such interproximal areas in a perfectly healthy condition. One might go further and say that a very essential qualification of a successful periodontist is that he becomes a good teacher.

In conclusion it may be said that the author's obviously earnest effort to present a graphic picture of the destructive nature of periodontal disease and its most serious sequelæ is to be most highly commended. In criticizing his pessimistic attitude our only desire is to point out that such an attitude is not justified in the light of present day knowledge. It is true that much has yet to be learned. There are still elusive factors which remain to be determined, for cases are seen in which the extent of the periodontal disease is out of all proportion to the local factors involved. And it is also true that too extensive destruction of the alveolar process renders the prognosis unfavourable. Nevertheless complete restoration to health may be expected if the following conditions can be secured—namely:

- a. if at least half of the alveolar support remains.
- b. if the patient has not a subnormal ability to react to stimulation.
- c. if the operator's skill is sufficient to enable him to adequately cope with the etiological factors involved.

d. if the patient's loyal, intelligent and enthusiastic co-operation can be secured.

One of the greatest joys in the practice of dentistry comes from seeing cases recovering health after treatment, and to the extent that knowledge of the control of periodontal disease increases this satisfaction is being experienced by an ever-growing number.

Dangers of the Barbituric Hypnotics

Abstracted by Dr. J. Stanley Bagnall.



REPORT given in *The Lancet*, May 14th, 1927, of a speech by Sir William Willcox at a meeting of the Section of Therapeutics and Pharmacology of the Royal Society of Medicine, May 10th, is of considerable interest to dentists, because of the increasing use of these drugs in Dentistry.

The barbituric acid group of drugs were introduced in 1902, and since then there has been a steady increase in hypnotics of this nature. Veronal, medinal, dial and the like have a certain speedy narcotic action which is eminently satisfactory, and after their use the patient wakes up without objectionable sequelæ. Prolonged use of these drugs may, however, produce symptoms almost identical with those of disease of the central nervous system. Sir William Willcox reported two cases which had been sent to him, one of allonal and one of veronal poisoning, by a neurologist, as undoubted cases of organic nervous disease. Ocular palsies, nystagmus, paralyses of the facial nerve or a limb, polyneuritis, ataxia, remarkable hypotonia of the muscular system, scanning speech, faults of memory and marked emotional instability, have all been recorded again and again in cases of poisoning. Most regrettable is the predominance of mental symptoms, and especially of depression, leading to frequent suicides.

Experiments carried out in Sir Frederick Mott's laboratories at Birmingham showed that continuous administration of these drugs produces pathological changes in the central nervous system which, although they usually disappear when the dose is discontinued, may nevertheless become permanent. The resemblance between the comatose condition produced by them

and the condition of normal sleep is only superficial, and under the influence of these drugs the margin between sleep and fatal coma in cats is a very narrow one. There was definite evidence of cumulative action, and of addiction to the drug. Patient should be warned against daily doses and preferably not more than one dose a week given.

Public Health Progress and Race Progress—Are They Incompatible?

BY H. S. JENNINGS, PH.D., BALTIMORE, MD.*

HE public health workers, the social workers, the civilizers, we are told, are corrupting the race; are destroying the race. By protecting us from our enemies, the bacteria and the viruses; by removing the sources of disease; by showing us how to avoid unfavourable conditions and to find favourable ones; in short, by bringing us and our environment into harmony, they are promoting the survival of the unfit; they are progressively filling the race with the weak and the degenerate, who must hand on their weakness and degeneracy to their descendants. This should all be stopped. In dealing with the delicate and ailing, our motto should be: Treat 'em rough!—Let the environment kill them. That's what will produce a strong race, a fit race.

To one who has spent his life studying the unnumbered devices by which organisms of all sorts protect themselves from their enemies; who sees that their daily, their hourly, occupation is the seeking of favourable conditions and the avoiding of unfavourable ones—to such an observer this proposal comes as a paradoxical surprise. The public health worker, the social worker, is not alone in this nefarious business of adjusting the organism to the environment; everybody's doing it. And by everybody I mean our brothers the birds and beasts, our cousins the insects and worms and plants; I mean all organisms. We ourselves have been doing this sort of thing for a hundred million years. It's going to be a hard habit to break, if we must break it.

And as we look at it, the difficulties become greater. All

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organisms are forced to defend themselves in all sorts of ways against other organisms that seek to destroy them; against bears and beetles as well as against bacteria. All organisms *must* protect themselves against the injurious forces of nature; against the heat and cold and wind and wet; against starvation and against over-eating; against unfit food and drink; against bumps and bruises and broken bones; against plagues and poisons. That's what life is; a struggle for existence. If any organism ceased to struggle, ceased to select its environment, ceased to protect itself,—its kind would become extinct in a generation. So it is with man, with bird, with fish, with worm, with protozoan, with plant.

We can't therefore hew to the line in this matter; we can't stop this whole business of adjusting ourselves to our environment. If there is anything at all in this proposal, it must be something very special. Are there limitations that must be placed on this protective struggle? Are there certain methods of protection that organisms must not employ; methods that overshoot themselves and fall on the other side; methods that lead to degeneration and destruction, instead of to the survival and prosperity that they are trying for? Are the methods of the public health worker of this sort? Or are there certain junctures in evolution when this protective work must stop, on pain of defeating its own aim? How shall we know those junctures? Has man reached one of them now? After unnumbered ages of striving for environmental adjustment must he now give that up?

Well, the point to all this—and it is beyond doubt a piercing point—comes to us from modern work in heredity; in genetics. That has revealed to us that there are perverted methods of promoting survival and propagation; perverted methods of deciding who is to survive and multiply, who is to perish without offspring,—perverted methods that may and do result in a degenerate population. Such a population has been produced by these methods. The fruit flies of Morgan's laboratory are the pattern and exemplar of the kind of population that the pessimistic eugenicist predicts for man; a population composed of the congenitally defective; the halt, the blind, the weak, the variously deformed and degenerate. Such things then can be done! We must sit up and take notice. What is it that underlies such results? How can they be avoided?

Experimental biology has shown that what underlies them

is this: At its beginning the organism is a complex thing, containing a great number of separable substances,—what we call the genes. By the interaction of these thousand substances—with each other, with the cytoplasm, with materials brought in from outside, with the forces of the environment—development takes place, the individual is produced with all his later characteristics. In early stages of development, the interactions of the genes produce new chemicals; enzymes, hormones, endocrine secretions; these again react with other products till there result, in a series of successive steps, all that we find in the body; the sex hormones, the thyroid hormone, the hypophysial hormone, epinephrin, insulin, the digestive and other secretions; the blood, the tissues, the organs, the mature individual.

But not all sets of genes are alike. Different individuals start with different sets. Some among the genes may be defective; sets containing these yield defective products. Hormones may be produced that are deficient in quality or quantity, or both; this results in further defects. If the thyroid secretion is defective, either from poor genes or poor nutrition, the individual fails to develop normally; it becomes that pitiful half-formed thing, a cretin, an idiot. If insulin is not properly formed, diabetes results. If the sex hormones are not normal, intersexuality or other discordant condition follows. These are types of the results which follow from the operation of defective genes, or from defective interaction of the genes.

But chemical therapeutics discovers that disorders due to defective genes can be remedied, if we know the means, just as other chemical processes may be influenced. The consequences of a defective thyroid secretion are remedied by introducing the thyroid hormone with the food; the pitiful cretin becomes a normal human being. Lack of insulin is similarly remedied, by introduction of insulin from outside. The necessary chemicals can even be synthesized, made artificially, as recent revolutionary researches show. The genes are not something mystical, unapproachable; they are organic chemicals. In principle, it is clear that defects in the store of chemicals given us by heredity may be supplied by other means; that undesirable things in the store of genes may be cancelled or corrected; that reactions among them which take an undesirable turn may be altered, set right. All these things are seen to be mere matters of technique; one needs but to know how. The great advances already made in this direction have

come in the last ten years. How far will they have gone in a hundred years? In a thousand years?

Wonderful possibilities are opened up by this work. Unfortunate human beings that must have suffered in misery, a burden to themselves and others, are made normal, useful, happy.

But consider now the further results of an enormous future development of synthetic chemistry; of chemical therapeutics. Defects in genes become as open to remedy as defects in nutrition. A defective thyroid product is replaced by manufactured thyroxin; the individual is restored to normality. But his genes are not changed; they remain defective; they are transmitted to his descendants. His descendants too must be treated with thyroxin. The genes of another individual are defective for the secretions of the hypophysis; of another for the suprarenal secretion; of another for the reproductive hormone; of another for insulin. Chemotherapy remedies all these defects—for these individuals. But their descendants, receiving the defective genes, must likewise come under the treatment of the chemist. In time the race thus accumulates a great stock of these defective genes. Every individual that receives them must be treated with one or more of the substitutes for the normal products of the genes. Each must carry with him an arsenal of hypodermic syringes, of vials, of capsules, of tablets. Each must remain within the radius of transportation of the synthetic chemical laboratory on which he depends. *This* is the result of remedying gene defects.

This picture is not an attractive one. Far better is the later condition of the race in which, through lack of skill in synthetic chemistry, defective genes have been cancelled as they arise; so that each individual bears within himself, in his stock of genes, an automatic factory for the necessary chemicals. That must be our aim; our slogan for future generations must be: Every man his own hormone factory!

How is that end to be attained? Is there any recourse but to strike at synthetic chemistry? Must the unhappy chemist be proscribed, prosecuted, imprisoned, hanged; his books burned, his teaching forbidden, his methods of work prohibited? Must the cretin drag out his life a helpless idiot, the diabetic sufferer unrelieved,—till their own defects close their lives in misery, and so cancel their stock of genes? Are these the methods that must characterize our policy toward defects in the genes?

It certainly behooves us as rational beings to examine such a situation with care; to search whether there be not peradventure another way of meeting it. And when we do this, we find these proposed measures to be totally and preposterously unnecessary, uncalled for, absurd; nay more, ineffectual. There is another recourse, a simpler one, a more effective one; an infinitely preferable one.

The mere survival of a genitically defective individual—nay, his enjoyment of a full, a useful, a happy, a long life—does nothing to increase the degeneracy of later generations, provided he does not propagate. Not survival alone, but also propagation, is required for the perpetuation of defective genes. Without propagation, survival is harmless, so far as racial deterioration is concerned. Can there be any question as to which shall be the point of attack? Surely we write ourselves down as asses, as doubly and triply stupid, irrational, perverse, if in order to prevent the perpetuation and multiplication of certain genes, we can think of no method better than to stop scientific investigation, to stop humane practices, to force our fellow beings to live and die in misery that we know how to prevent. The lives of persons bearing defective genes may be made as satisfactory, as complete, as the most advanced methods can make them, without the smallest harm to the race,—but they must not propagate.

The Proteins and Minerals in Milk

DOROTHY R. MENDENHALL, M.D.

ILK contains four proteins, of which two are present in considerable amounts. The curd of milk, which contains all its casein and part of its lactalbumin, has been found to be most valuable for building or renewing body tissues. There is no other animal protein of known value procurable at so low a price as the proteins in milk. Grains, legumes and nuts do afford efficient proteins, more so than those of tubers and other vegetables; but, in general, plant proteins are not so valuable as animal proteins for tissue building and should not be relied on solely as a source of body-building protein.

Of all the minerals necessary for the growth of the child from conception to adult development, none is of greater importance to all parts of the body than the calcium and phos-

phorus salts, because these are the essential building materials for bone, which is largely calcium phosphate. Since growth is measured by the development of the skeleton, and since the child must have a steady, abundant supply of calcium, as well as of certain vitamins, to build bones and teeth, body organs and fluids, milk should be included in every child's diet during the entire period of growth. "There are but two classes of calcium-rich foods—milk of animals and the leaves of plants." Of all food sources of calcium, milk and cottage cheese are the cheapest, most easily available, and most abundant. Milk also provides other important minerals such as phosphorus and potassium.

When it is realized that one quart of milk will furnish as much calcium as 10 large oranges, 10 large helpings of spinach, 24 large helpings of carrots, 32 eggs, or 20 pounds of beef, the value of milk for growing children can be appreciated.

Unfortunately, cow's milk is low in iron content, probably even as compared with human milk, and this important mineral must be supplied by other foods. In spite of the fact that the form of iron in milk seems especially favourable for assimilation, the prolonged exclusive use of milk after early infancy tends to produce anæmia due to lack of iron in the food. It is generally stated that the infant has considerable iron stored in the liver at birth, which enables it during the period of breast feeding to thrive on a food as low in iron as human milk. Iron can best be introduced in the diet through the use in early infancy of fruit juices, green leafy vegetables, and egg yolk, and later of whole cereals, beef, and potatoes.—*Clinical Notes.*

Good Teeth



IF expectant mothers received ample, well-balanced diets, in which green vegetables were abundantly supplied, and cow's milk was regularly taken, and if pregnant women spent more time in the open air, if babies were kept more constantly out of doors and placed in the direct rays of the sun for a good part of each day, and if they were given a sufficiency of milk and cod liver oil for the first two years of life, more could be accomplished in regard to the eradication of the decay of teeth than by all other treatments put together."

Practical Laboratory Methods in Orthodontia*

ERNEST N. BACH, A.B., D.D.S., TOLEDO.

HE laboratory procedures that are to be described, with but few exceptions, are those of other men, and I feel greatly indebted to them for having imparted their knowledge to me. The object of this paper will have been fulfilled if this same knowledge be conveyed to you.

In dealing with the subject of "Practical Laboratory Methods in Orthodontia," it is difficult to say where the work in the operating room ends and the laboratory work begins. For convenience we will make impression-taking the first step for discussion.

Without exception, a plaster impression is the most accurate negative from which a plaster model can be made. The usual procedure consists of making a creamy mix to which has been added a "setter"; greasing the tray and pressing tray and plaster to place in the mouth, letting the plaster set, removing the tray and eventually the plaster sections. In addition to this as a time saver in removing plaster, two slots are made in either tray with a fine scroll saw through the total width of the vertical section of the tray in the region of the cuspids. After the tray and plaster are pressed to place, and the plaster has slightly set, a thin piece of cardboard, such as a calling card, pressed with "nujol," is inserted in either slot until it touches the teeth and tissues. The cards are removed just before the plaster is hard, and after the plaster is thoroughly set, the tray is removed and the usual anterior portion is easily sectioned out.

For making more definite fractures between the buccal and lingual sections, an inverted V-shaped ridge of tin one-eighth of an inch high and one-eighth of an inch wide (at the free end) and of a length to include molars and bicuspid, is waxed or soldered to the tray, the position being determined by the anterior-posterior line midway between the buccal and lingual cusps of these teeth. After the tray has been removed,

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a V-shaped groove is left in the plaster close to the occlusal surfaces of the above-mentioned teeth, provided the tray has been pushed properly to place. The fact that the groove is V-shaped instead of knife-edge, prevents the crushing of the plaster over the occlusal surfaces when the buccal sections are forced off. These impressions will consist of fewer pieces, making the assembling and separating from the model easier.

THE USES OF COMPOUND IMPRESSIONS.

Regular compound impressions are very useful in cases of children who are afraid or timid, and in older ones where drag marks would not result. In protrusion cases, the McCoy method proves unsatisfactory. The anterior portion of the tray between the cuspids is removed, and compound is placed in the tray and pressed to place, leaving the labial surfaces of the four anterior teeth and adjoining surfaces of the cuspid exposed. The compound is thoroughly chilled and the exposed surface greased with nujol, then more warm compound is pressed over the exposed tooth and gum surface. This is hardened by compressed air. The small section is removed first, and later the remaining compound and tray are removed. The two parts are assembled, waxed together, poured and separated in the usual manner. All compound, if heated over a flame just before insertion in the mouth, will give a more detailed impression.

PLASTER MODELS.

Models may be made of regular plaster, stone plaster or a combination of stone and plaster. Regular plaster seems adapted for pouring compound impressions, its objection for use in pouring plaster impressions being the ease with which it is broken in separating. Stone plaster for models is successfully used with any impression, its chief objection being the difficulty in trimming the art portion after it sets completely and the length of time required for setting. The material that answers the purpose best for plaster impressions seems to be a combination of stone plaster and regular model plaster. The stone plaster is packed into the anatomic portions and the regular plaster poured on top of the stone plaster forming the art portion. Roughing the surface of the stone plaster makes a better union with the regular plaster. This combination makes the trimming of the model easy after both portions have fully set.

TRIMMING.

In trimming models, we have been using a combination of two methods, which seems to work out very well. Models are levelled in the usual way and all rough trimming done with an Oliver trimmer, which sets over an open drawer containing a tin receptacle that receives the plaster shavings. After the rough trimming is finished, the fine work is completed with a carpenter's wood plane (one about 8 in. long). A hard wood block 8 in. by 12 in. by 1 in., on which is fastened a smaller hard wood block 4 in. by 12 in. by $\frac{1}{4}$ in., leaving half the original block exposed, is used. The model is placed on the thin wood section, and the plane, lying on its side with the cutting edge toward the model, is pushed back and forth, trimming the model edges. These are always at right angles to the top and bottom, provided the plane is kept securely on its side when working.

After the models are trimmed and allowed to dry, they may be finished with a glossy coat by making a jar of "ivory" soap suds and washing them in it, and rubbing or drying off with air. The other way consists in rubbing the model with soapstone and a piece of cloth. This process tends to retain the original colour of the plaster and shed dust and dirt.

METHOD OF RECORDING MODELS.

A convenient way of recording models is as follows: Patients are given an even number beginning with two in the order in which they are received in the office. When study models are made from time to time, the same number is used for each model with an exponent one, two, etc., denoting the number of models taken since the original. When the case is completed the finished model bears the next highest odd number. The name and age of the patient and date of the impressions are recorded on the back of the lower model, and all lettering is done in India ink. The models are arranged numerically in cabinets.

APPLIANCES.

A discussion on the making of appliances could cover many pages, but only a few points which seem to bear particular relation to the subject will be here considered.

After bands are made, either directly or indirectly, a good

compound or plaster impression is taken with the bands on the teeth. These bands are removed and inserted directly in their impressions in the impression material. Staple shaped pieces of wire are inserted in individual tooth impressions for strengthening the teeth in the plaster model and especially the ones that are banded. This applies particularly to anterior teeth when attachments are soldered to the bands as the plaster becomes very brittle and porous. Regular plaster is satisfactory for soldering upon, although various stone plasters are used by many. Stone plasters allow a more complete contouring of the occlusal edge of the molar bands when malleted.

Dr. Porter described a splendid method of making models for rapid work when an appliance has to be made immediately. To a quarter of a bowl of very warm water, from one-half to three-fourths teaspoonful of salt or potassium sulphate is added and plaster is stirred in very quickly. One must work rapidly to insert this into the impression before it sets. The model will be ready for separation by the time the bowl is cleaned and the materials put away. If compound is used, it is heated over a flame to soften and is then removed. The operator does not wet either plaster or compound impressions to separate them, and thus the model will be dry to solder on.

By use of a Blue Island soldering stand, the model is clamped to the rotating table and the desired attachments are soldered to the molar bands. The cusps of the banded molars are trimmed flush with the occlusal edge of the bands and a piece of match stick or other wood is clamped on top of each band; this preventing the band from being displaced when the labial and lingual wires are adapted and inserted in the tubes.

A convenient way of holding tubes that are being soldered to bands is to use a steel needle that has been driven into an orange-wood stick. The needle should be but slightly smaller than the tube. For vertical tubes, the free end of the needle is bent while red hot, at a right angle, the distance from the end being equal to the length of the tube used. The tube is placed on this and held against the band on which solder has previously been placed, and soldered there. Steel is used, as solder adheres with difficulty to it. "Anti-flux" also will prevent undesired soldered joints. Whenever tubes and connections are to be soldered to bands, a small amount of solder is melted on the spot, which leaves both hands free when

soldering, one to hold the attachment and the other the blow-pipe. Solder is used in wire form. When very small amounts of solder are desired, the size is from 26 to 28 gauge, and when larger amounts are needed, 21 or 22 gauge is more desirable. This is purchased in a coil and the whole coil fluxed with soldering flux and dried with the flame, which saves fluxing each time a joint is to be made. Mellotte's blow pipe proves very satisfactory for soldering as a small pencil flame is obtainable. All stabilizing wires are bent with heat, the labial being very easy to bend. The wire is placed in the tube on the left side and heated with a brush flame and gently bent while hot. The wire is liable to break if too much pressure is used and not enough heat. A pointed flame is used where a sharper bend is desired. Lingual arches may be adapted in a similar way, although a general adaptation by hand first, later using heat and a slate pencil to adapt accurately, has proved more satisfactory.

USEFUL HINTS.

The following items, although not topics for discussion, are worthy of note. Appliances are easily cleaned by boiling in hydrochloric acid in a porcelain crucible. Dr. Barnes has a neat way of preventing the spattering of acid when heated appliances are placed in it. He uses a large round glass jar 6 or 7 in. in diameter and 2 or 3 in. deep, which contains a solution of sodium bicarbonate, and inside this is a smaller jar, yet large enough to receive an assembled appliance, which contains the acid. The larger jar serves two purposes, neutralizing both action of the acid on the appliance when it is dipped in it, and the undesired action of the acid on the surrounding material. A cover glass fits the larger jar.

Round wire is difficult to handle with flat nosed pliers, but if these are grooved in two directions, parallel with and at right angles to the long axis of the handles, the difficulty is greatly overcome. The grooves can be made with an iron drill not larger than 23 gauge.

The grooving of soldering tweezers is also worth the effort. Small spring wire can be held quite securely with this tweezer.

A fine mesh, brass wire gauze serves a good purpose when so arranged over the end of a blowpipe which is lighted, but not in use. The gauze distributes the heat without becoming excessively hot itself and may save many burns.

Another little convenience may be found in the use of an air and gas regulator for the blowpipe and burner. On either the gas or air outlets, two valves are placed between the outlet and the blowpipe or burner. The one nearest the burner is set to give the desired air pressure and is left in this position, and the other is used for a shut-off only. This saves regulating air pressure each time the burner is used.

The top of the cabinet on which soldering is done is covered with Johns-Manville asbestos composition material. This is one-fourth inch thick, hard and heat resisting and is black. This dark surface enables one to see the small cone of the blowpipe and burner.

Each of these topics which have been mentioned or discussed has been of help to me, and I hope may prove of benefit to others.

Two Fellowships Established in Faculty of Dentistry, University of Toronto



At the last meeting of the Senate of the University of Toronto two Fellowships in Dentistry were established, the object being that there may be advances in newer knowledge and a broader application of established principles, in the practice of Dentistry as a health service.

Each fellowship has an annual value of \$250, one being donated by the Ontario Dental Association and the other by the Ash-Temple Company.

Expansion in all branches of dental science and practice has taken place so rapidly during the past decade that there is great need for scientific study and research in dentistry. It is hoped that the establishment of these fellowships will foster dental research and add to the number of better trained men for service in dental teaching and literature.

CONDITIONS OF FELLOWSHIP.

1. These Fellowships shall be awarded annually and have a value of \$250 each.
2. The holder must be a graduate in Dentistry of a recognized Canadian University, and appointed as an intern in a hospital.

3. In order that complete facilities for dental research may be available to the intern, the hospital shall have a properly organized dental service along the following lines:—

(a) The hospital shall conduct a Dental Department as a major service with a graduate in Dentistry as chief of the department and a member of the active staff of the hospital holding the same relative rank as the chiefs of the other hospital services;

(b) The hospital shall maintain an out-patient dental clinic and operative room, and an in-patient clinic and operative room;

(c) The hospital shall require that all public ward patients receive routine dental examination, which shall be charted on a special form and retained with the patient's history.

4. The conditions of internship shall be as follows:—

(a) Intern to be free for research work not less than four hours each day upon a problem satisfactory to the Faculty of Dentistry of the University of Toronto;

(b) Research work to be under the direct control and supervision of the Faculty of Dentistry;

(c) Hospital to be located sufficiently close to the University buildings to permit of direct supervision.

5. Fellowships to be awarded upon the recommendation of the Faculty of Dentistry.

6. Payment of Fellowships shall be made in two instalments—One, December 15th and the other April 15th upon certification of the Dean of the Faculty of Dentistry of the University of Toronto that the work is proceeding satisfactorily.

7. The holder of either of these Fellowships after the successful completion of one year, is eligible for re-appointment.

8. The holder of either of these Fellowships shall be given the same remission of fees as those who have similar Fellowships in other faculties.

American Dental Association, 1928

The Seventieth Annual Session of the American Dental Association will be held in Minneapolis, Minnesota, August 20-24, 1928.

Some Observations on Amalgam

M. L. WARD, D.D.Sc.

BLACK held that even a minute quantity of zinc caused an excessive expansion of the setting amalgam. Modern practice would appear to show that a more thorough trituration of the mix, more pressure in packing, accomplishes the same result. Moreover, the initial shrinkage is lessened, a factor which largely escaped the observation of all earlier workers.

Black and his followers overrated the strength of amalgam. Better results would follow if the occlusal margins, if bevelled at all, were made much deeper than for gold foil or gold inlays; the step portion of proximal cavities in molars and bicuspidis should be larger than for gold foil or gold inlays; that there should always be a good seating, in some instances the buccal and lingual walls should be grooved, so that the step portion should not be subjected to undue stress. If in addition cement lining for amalgam fillings were more generally used, low strength would be a negligible feature.

Amalgam has the weaknesses from which gold is free: (1) change of volume because the alloy and mercury are only partially combined at the time of making the filling; (2) there is no place where it will not yield under even low pressures. These two weaknesses can be overcome by greater attention to the foregoing.

Cavity Preparation.—Black's teaching on the subject of cavity preparation must not be taken as final. Our knowledge of the relations of the pulps of teeth to some of the practices associated with the application of these principles, as well as our knowledge of the properties of filling materials, has been greatly extended. Black himself was under no misapprehension on this point. Ever he had in mind to form the cavity in accordance with the demands of the case. The practice of "extension for prevention" was subject to variation, depending upon the susceptibility of the case in hand.

Manipulation.—If a given product is so compounded that it will increase in volume during the first few hours after being set hard enough to be handled without breaking, this increase may be varied by the degree of completeness of the mix and the pressure used in packing. If large unbroken particles of

alloy be left in the mass to be acted upon by the mercury after the filling has been inserted, the result is less change in volume in the hand and mortar during the mixing process and more takes place in the tooth. The reaction started between the alloy and mercury in the mortar does not stop when the amalgam is inserted in the tooth. It is, therefore, necessary to give careful attention to securing as complete a union of the alloy and mercury as possible, and at the same time to have a mass which may be properly packed. It has been demonstrated that when amalgam is subjected to extremely high pressure during the setting process, there is a close contact established between the alloy and mercury, with the result that the reaction between the two is more complete and the volume change less. Unfortunately these pressures are generally too high to enable them to be used in the mouth, but may be used to great advantage in model making.

All good high-silver-content, properly balanced alloys will, when mixed with mercury, produce a filling which is slightly increased in volume with the manipulation that is necessary to produce a mass such as is best suited to good packing. Therefore it is imperative when using amalgam to bring about as perfect a union of the combining materials as possible if volume change is to be made a negligible factor.

The strength of amalgam is of almost equal importance with that of volume change. It was formerly held that the strength of an amalgam was dependent upon a high silver content.

Tests were made with one-fourth inch cylinders. It was found that these would crush explosively, at from 2,100 to 2,500 pounds, if the load were applied rapidly. If fillings of the same size were subjected to this crushing test over a period of 20 to 25 minutes, the crushing resistance would be reduced approximately to 1,650 pounds. When the load was applied over a period of one hour, the specimen would not crush, but would bend and flow into an irregular mass. When the tensile test was applied to a cross-section of amalgam of the same size as the cylinders that were crushed it was found that these specimens would pull apart at approximately 280 pounds. It was further found that the cylinder that had been made for the crushing test could be sheared apart at 123 pounds. When the impact test was applied amalgam broke as easily if hit quickly from one side as a good grade of glass

rod or porcelain. It would appear then that too much confidence has been placed upon the compression test as a measure of resistance of amalgam to the forces that are exerted upon these fillings in proximal portions of molars and bicuspid. — (*Dental Cosmos*, August, 1927).

Dental Instrument Sterilization

T is the purpose of this paper to summarize briefly from the many methods that have been suggested for sterilizing dental instruments, those procedures which are effective against all forms of bacterial contamination without differentiating between spore-bearing and vegetable cells. Methods are omitted whose efficiency is dependent upon some peculiarity of technique or whose reliability has been questioned.

PRE-STERILIZATION TECHNIQUE.

All instruments should be brushed vigorously while being held under a stream of running water, using soap as a detergent to remove blood, pieces of tissue, pus and other adherent matter. The bacterial contamination will be largely eliminated during this process. A stiff-bristled brush about the size and shape of a nail brush is convenient for this purpose. It is important that the bristles be in good condition as the efficacy of the cleansing depends upon the thoroughness with which the crevices in the instruments are cleansed. As soon as signs of wear appear, discard the old brush for a new one.

AFTER STERILIZATION PRECAUTIONS.

A sterilized instrument remains sterile only as long as it does not come in contact with bacteria. Sterile towels must be used for drying instruments and sterile forceps for removing root-canal points from the sterilizer. The dentist who is constantly alert to prevent contamination of his instruments will develop an "aseptic sense" that will aid him to achieve and maintain strict asepsis.

BOILING.

All metal and glass instruments, including mouth mirrors, may be sterilized by boiling for ten minutes—but the water

must boil for ten minutes if sterilization is to be assured. To prevent rusting, the water should boil for five minutes before the instruments are immersed, or sodium hydroxide should be added to the water if the instruments are to be placed in water which is not boiling. Sodium carbonate can also be used to prevent rusting, but a sufficient quantity to make a concentration of one per cent. is required. As this requires measurement, the use of hydroxide is preferable.

At the expiration of the ten minutes the instruments should be removed promptly and dried with a sterile towel. For those whose construction makes drying difficult, immersion in 95% alcohol for ten minutes followed by removal to the cabinet without drying will remove the moisture.

One type of sterilizer has been constructed in such a way that the instruments may be dried in the sterilizer, thus eliminating the use of a sterile towel, an article not always available. As the process of sterilization and of drying are automatic, this sterilizer appears to afford a decided convenience to its user.

GLASS SALIVA EJECTORS.

To avoid the danger of breaking these instruments by boiling, sterilize them by immersion in 10% solution of hydroxide for thirty minutes. This solution has the added advantage of dissolving any organic debris such as mucus which may be present in the ejector. The ejector must be thoroughly washed before it is placed in the mouth of a patient as the solution is very caustic. Also the ejector should be removed from the solution with forceps or rubber gloves to protect the hands.

As the sodium hydroxide is rapidly converted into sodium carbonate when in contact with the air, the solution should be freshly made each day.

STERILIZATION DURING OPERATION.

Occasionally during the course of an operation the dentist wishes to sterilize the instrument he is using. Dipping in alcohol and burning it off by igniting the alcohol will destroy all the non-spore-forming organisms. Fortunately, spore-bearing bacteria are rarely encountered in the mouth, so the method is satisfactory for the purpose indicated. When absolute sterility is essential, burning off a surface with an inflammable fluid cannot be relied upon.

STERILIZATION OF THE HAND PIECE.

This is a particularly difficult implement to sterilize. Boiling removes the oil necessitating re-oiling, and even the most careful treatment frequently fails to prevent rusting. Chemical disinfectants offer similar difficulties. Appleton has, however, solved the problem in a very satisfactory manner and he is quoted as follows:

“Wipe the handpiece free from moisture, be particular in this regard to the parts in contact with the bur, leave the bur lock open, immerse completely in mineral oil at 185°C for five minutes, or 175°C for ten minutes, or 165°C for fifteen minutes. It is immaterial from the bacteriological standpoint which temperature is chosen, as long as the time of exposure is sufficient. The temperature during the sterilization should not fluctuate more than three or four degrees Centigrade, plus or minus. If the instrument is removed as soon as the necessary time has passed, it is very easy to wipe it free from oil with a sterile towel. The heat is evidently sufficient to volatilize any thin film of oil that might remain and otherwise soil the hands.”

At about 140°C mineral oil begins to smoke and care must be taken that it does not come in contact with a free flame as fire may follow. It does not char, however, even at higher temperatures. The oily odour is not offensive but sterilization should be conducted in the laboratory rather than in the operating room. The Pelton and Crane Company advise that their sterilizers may be used with oil, but that owing to the escape of the fumes, sterilization by this means should be confined to the laboratory or sterilizing room. A sterilizer specially constructed for oil has been developed by the Wilmot Castle Company and facilitates the use of this medium. However, owing to the escape of the oily fumes when the lid is raised the operation of this sterilizer should be confined to the sterilizing room.

MOUNTED STONES.

Corborundum disks, wheels, and stones mounted in porcelain can be boiled. Those with a rubber, cement or shellac base must be sterilized in 5% phenol solution for one hour, followed by 95% alcohol to remove moisture.

ROOT-CANAL POINTS.

Cotton, paper, or gutta-percha root-canal points may be sterilized by Prinz's method. This consists of attaching an inch-long section of a cotton roll to the inside of the cover of a screw-cap bottle. Sealing wax is a convenient agent to use for this purpose. A few drops of dichloramin-T solution are placed on the cotton, the points are placed in the bottom of the dry bottle, the cap is screwed on and the sterilizer is complete. The dichloramin-T solution must be renewed every month.

—*Bacteriological Survey.*

Cleansing Gold



SMALL pieces may be pickled in test-tubes, larger pieces in a porcelain dish. Copper vessels should not be used for pickling as the gold may come out copper-plated. The ideal pickling vessel is fused quartz, but this is expensive.

Fifty per cent. sulphuric acid solution is recommended. Hydrochloric acid works very well, but the fumes rust instruments laying about in the workroom. Acid alum makes a good pickling solution, especially for the lower grade metals, and 50 per cent. nitric acid is good for some golds. Some workers pickle each time they anneal. This is not necessary unless they are using fusible metal or amalgam dies.

Keep mercury away from gold. Always have a solution of sodium bicarbonate in which to dip the piece after its removal from the acid. Should any of the pickling solution get into the eye, wash it with sodium bicarbonate or boric acid, or in an emergency with clean hot water. All workrooms should be provided with goggles with safety glass for soldering, casting and pickling. Hot metal and acids have flown into the eyes in a number of instances, due to explosions of investments, or dropping hot pieces into acid. When mixing acid and water, always pour the acid into the water, not the water into the acid, and there will be no spluttering and flyings.—E. KENNEDY, D.D.S. (*Dental Items of Interest*, July, 1927).

Suggestions for Professional Speakers Before Lay Audiences

1. *Be Simple*—When Abraham Lincoln wrote the Gettysburg address he used one-syllable Anglo-Saxon words. "Etiology," "prognosis," "asepsis," and the like are simple as the A B C's to you; to the layman they are as baffling as you would find words accurately descriptive of astronomical phenomena. When a man doesn't understand he is bored. Talk in terms which represent the least common denominator of what you both know.

2. *Be Personal*—The lack of it irritates your audience in the beginning. The best way to be impersonal is to read a paper. The next best way is to commit a speech to memory. If you are unaccustomed to lay audiences and are afraid you will lose the thread of your argument, write each point in large clear type on an ordinary 3 in. x 5 in. card which may be held inconspicuously in the palm of your hand. Refer to the card openly when you have completed your discussion of one point, then slip it on the bottom of your pile. Never put your notes on sheets of paper.

3. *Be Comfortable*—If your natural standing position is with your hands in your pockets, stand that way when you talk to an audience; if you're a leaner, pick out a chair or a table or the wall and lean with a clear conscience. The important thing is for you to be much more concerned about what you are saying than about the impression you are making. You're all right in your everyday manner or you wouldn't have been asked by the organization to address them. It's only when you get on dress parade that you might be stiff and funny.

4. *Be Clear*—The most important thing is that you should be heard by everybody in the room. This is much more likely to happen if you hold your chin up and talk to the back row. Don't shout. Listen to your own voice and you can keep your tones in your chest and out of your nose and your throat when they are raucous and unpleasant. Enunciate as clearly and deliberately as if you paid a five-dollar forfeit for every word that escaped your hearers. Take your time.

5. *Be Positive*—Except in response to a direct question, never make reference to quack, cultist or irregular practitioner.

You can't sell a Rolls-Royce by discussing the advantages of a secondhand wheelbarrow. You have an idea to sell which is far more valuable than any piece of merchandise. It would waste your time and energy and magnify the importance of that which you know to be without value if you attack fraud before an audience. A talk which is pro-anything will not be irritating, no matter how much individual auditors may disagree with it. A talk which is anti-anything arouses irritation and defense of the under-dog.

6. *Be Concrete*—Glittering generalities go in one ear and out of the other. Illustrate everything possible from your own experience. Give examples of what you mean. Explain every possible statement.

7. *Be Earnest*—Talk only on the things you believe in with all your heart. A clumsy, zealous, thoroughly earnest speaker will create a far more favourable impression than polished, suave, graceful, eloquent insincerity.

8. *Be Natural*—Modern public speaking discourages eloquence. If you can tell a good story to your friends and they get the point immediately, you can tell a good story to your audience. If not, don't try to be funny in public. It is still worse to be flowery. There are few Patrick Henrys in the medical profession or any other profession, and we have no need for them. Your job is to stand on your two feet and tell clearly and with the same authority as if you were speaking to your own patients in your own office a few plain facts on which you are probably the only person in the room who is fitted to talk. It's a good place to cultivate a superiority complex, provided you don't patronize your hearers. It's worse to talk down to them than to talk over their heads. In the latter instance they are merely bored by you and in the first case they actually dislike you.

9. *Be Brief*—There was a certain famous minister who used to say that no souls were saved after the first thirty minutes. Find out exactly what time is allotted to you and stop on the split second. Long-windedness is especially to be guarded against because any medical or health subject you may take is so big you can't possibly discuss it thoroughly in any one talk. Don't try to. Take one phase of one angle of the subject and pound it in. Let them leave you with an appetite for more on the same subject. The exhaustive discussion is usually exhausting.

10. *Be Careful*—Many eminent persons in the field of health education are chiefly distinguished as crepe hangers. Pathological discussions of disease and death defeat the ends of prevention. Folks are more interested in living than in keeping from dying. Remember the fable of the boy who cried, "Wolf, wolf!" when there was no wolf. By the time he had a real warning for his neighbours, they paid no attention to him. You can't scare folks into doing their duty more than a few times in their lives.

THE CRIMES OF SPEAKERS.

- A. Reading a paper.
- B. Being hard to hear.
- C. Affectation and insincerity.

THE ACHIEVEMENTS OF SPEAKERS.

- A. Leaving a more friendly feeling for organized medicine in general and the local medical men in particular.
- B. Putting across one piece of accurate useful medical information.
- C. Creating an appetite for more information on the same general subject.—*Illinois Medical Journal*.

The Use of Forceps

ADOLPH BERGER, D.D.S.



WHEN a tooth which is intact, or still retains a portion of the crown, is to be removed, the forceps should be applied at the neck or as close to the root end as the form of the forceps or the relationship of the gingiva and the alveolar process permit. When this portion of the tooth is weakened by caries, or other means, as in teeth supporting dowel crowns, the forceps should be applied at a point where the root is firm enough to withstand the pressure necessarily applied in the removal of the tooth.

The crown of the tooth should never be relied upon to bear the strain required in dislodging the tooth, even when it is loose in the alveolus. The crown of the tooth when firmly grasped is readily crushed by the pressure of the forceps, or fractured off through the leverage applied. When the tooth is thus grasped, there occurs also a loss of some mechanical advantage

as the leverage and strain upon the root is increased with the distance between the point of application of the forceps and the apex of the tooth. This clearly implies a greater tendency toward fracturing at some intermediate point. When the forceps are applied at the neck or beyond this upon the root, the removal of the root is facilitated by reducing this distance and therefore the leverage. Also the neck of the tooth when not reamed out or weakened by caries, will sustain more pressure without crushing than is ordinarily exerted with the forceps.

In removing a tooth, the field of operation must be exposed by withdrawing the cheek with the finger. The beak of the forceps is adjusted to the palatal or lingual aspect of the neck of the tooth first. When the forceps are properly applied, both beaks should grasp the root at a uniform level. The pressure must be adequate to maintain this position during the extraction movements. If the forceps are only loosely held the force exerted will not be expended toward the displacement of the tooth, and the beaks will tend to glide over the crown in the manner of a joint. When this movement is excessive, the open beaks may be placed at an angle so that they bind rather than grasp the tooth, at different levels. This very frequently results in fracture of the tooth. If the beaks of the forceps are applied at different angles, the force applied will be centred principally upon the beak which contacts nearest to the gingiva, and the tendency is to fracture the tooth at this point.

The beaks of the forceps must at all times be applied parallel with the long axis of the tooth. To fully utilize the force applied in causing dislodgment of the tooth, it must be transmitted through the entire length of the tooth and centred at the apex.

The forces employed in the removal of a tooth are: pressure or pushing force; lateral or rocking motion; rotation or torsion; traction or pulling force.

Teeth are, or should be, pushed rather than "pulled out." The pushing force is begun upon the application of the beaks of the forceps, and before they are tightly closed upon the tooth. With a gentle lateral movement and pushing force, the beaks are gradually insinuated beneath the gum margin and over the root, until the portion to be grasped is reached. A gentle pushing force is maintained even after the tooth has been firmly grasped, so that the pressure is transmitted through

the entire length of the tooth, as though trying to force the tooth through the socket. In doing this the apex of the tooth becomes the point upon which it is turned until it is completely loosened in the alveolus. A further advantage in continuing this force is that the forceps will tend to stay on securely and remain under complete control.

Lateral motion consists in moving the tooth toward the labial or buccal and palatal direction in the upper, and lingual direction in the lower jaw. These movements are performed after the forceps have been properly applied and the tooth is firmly and securely grasped. They are repeated until all attachment has been broken, the alveolus has been widened to some degree by fracturing, or through the yielding of the alveolar process, and the tooth is quite loose and ready to be delivered.

With the beginning of rotation, pressure toward the apex is discontinued and slight traction is applied. This motion can be used to the best advantage in single-rooted teeth. Rotation may be used to a slight and guarded degree in the removal of even multi-rooted teeth, after the tooth has been loosened in the alveolus. During the delivery of the tooth this lateral motion is helpful to break down the remaining attachment where this occurs, and also to increase the diameter of some constricted portion of the alveolus, so that the tooth can more readily pass through its anatomical channel. Rotation should always be applied with some degree of discretion, as in multi-rooted teeth, with divergent or frail roots, or when a root is curved, fracture is very likely to occur.

Traction in itself should rarely, if ever, be used in the removal of a firmly rooted tooth. The attempt to literally pull a firm tooth from its socket is always inefficient, often ineffectual, nearly always uncertain and to some degrees hazardous. Traction should therefore be used only in the case of a very loose tooth, or after the tooth has been completely detached from the enveloping tissues, loosened in the alveolus and merely to deliver the tooth from its socket.—*Dental Items of Interest.*

Wrong Diagnosis

Doctor: "Did you tell that young man of yours what I thought of him?"

Daughter: "Yes, daddy, I did; but he merely said that you were wrong in your diagnosis, as usual!"

A Method of Applying Cement to Cavity Walls

R. H. REESE, D.D.S.

F cement is judiciously used in the preparation of cavities for metal fillings, it will not be necessary to remove strong overhanging walls to anything like the extent necessary when only metal is to be inserted. In the preparation of cavities for inlays the undercuts may be filled with cement, and this will strengthen the remaining walls. For gold foil or amalgam fillings the retaining form may be made in the cement rather than in the tooth substance.

Remove all decay and all frail walls, but do not cut away strong overhanging walls because they are not supported by dentine. Sterilize the cavity, and shape enamel margins to desired form. A matrix band (steel 1/1000 inch in thickness) and matrix clamp are required.

Adjust the matrix about the tooth to be filled. Lubricate the inside of the matrix and all of the tooth surface that can be reached, including the cavity surface, with vaseline or cocoanut oil. Apply a little vaseline to the apex of a cone of modelling compound and heat the cone over a small flame just as it is heated for taking a cavity impression for an inlay. With firm pressure take an impression of the cavity and of the adjacent tooth surface. When the compound has cooled until it is about as hard as soft india-rubber withdraw the impression from the cavity about one-sixteenth of an inch and then re-seat it. Continue to withdraw and re-seat the impression, drawing it out a little further each time until it can be easily withdrawn. Chill it in cold water. When the impression is seen to be satisfactory the matrix may be removed from the tooth.

With a narrow sharp-pointed blade, cut away from the cavity surface of the impression all the compound which is to be replaced by cement. Thoroughly clean and dry the tooth with chloroform. In all deep cavities it is desirable to use a cavity lining. Cut away the excess of compound around the margin of the cavity. The impression is to form a plunger, and for this purpose the remaining portion of the cone will form the handle. Lubricate the cavity surface of the impression with vaseline.

Begin the mixing of the cement, using a dark cement so that

the surplus can be readily seen and removed. Otherwise some of the cement may be left on the margins. The cement slab must be perfectly clean. Place the desired quantities of powder and liquid on the slab, a little distance apart. Separate from the pile of powder a quantity about as big as would go on the head of an ordinary brass pin and thoroughly incorporate it into all of the liquid. Leave it thus while drying the cavity with chloroform and inserting cotton rolls, etc. Mix the balance of the cement by incorporating each time into all of the liquid small portions of the powder and rubbing thoroughly. The cement will be of proper consistency for placing in the cavity when it offers a little resistance to the rubbing motion of the spatula, or when, if the spatula is laid flat on the cement and then lifted from the slab, the cement is a little stringy.

With an old explorer point tease the cement into the cavity, taking care to eliminate air in the undercuts. Place a little cement on the cavity surface of the impression which is now to be used as a plunger. Insert the plunger into the cavity and press to place, then hold in this position with pressure for five minutes.

When the cement has set, as judged by the cement on the slab or spatula, remove the plunger and trim away the surplus cement from the tooth. By the use of an end-cutting bur, with the cement pulpal wall as a guide, a flat gingival seat may be established. A gingival margin-trimmer should then be used to bevel this margin. With a stone grind a fissure bur so that it will not cut on the end. Hold the smooth end of this bur against the occlusal cement pulpal wall and make the occlusal margins of the cavity parallel. These margins should be bevelled and polished with fine stones.—(*Dental Digest*, July, 1927).

Effects of Traumatic Occlusion



TRAUMATIC occlusion as usually defined is an occlusal stress which is in excess of the functional tolerance of the supporting tissues of the teeth involved. It is apparent that disease does not necessarily and inevitably follow the production of excessive occlusal stress. When occlusal stress exceeds the functional tolerance of the supporting tissues, nature's first impulse seems

to be, as it is elsewhere in the body, to build up additional reinforcing tissue. The reinforced support will then presumably counterbalance the functional super-stress to which the tooth is being subjected. Where it takes place, the occlusal stress is only slightly beyond the normal functional tolerance of the tissues. The stress may then be considered to be a stimulus. The physical relationship, however, is mechanically identical in principle in all cases, whether the load is slightly or greatly in excess of the physiologic tolerance of the tissues.

In some instances it happens that the position of the teeth, or their cusp form, is such that stress brought upon them is far in excess of the presumptive tolerance of the supporting tissues, or is at least out of proportion to the stress which is brought to bear on the other teeth in the mouth. Under such circumstances, wear of occluding surfaces may take place in such a way that the original stress is modified to an extent which brings it within physiologic limits, or reduces it to the level of the stress to which the other teeth are subjected. If such functional wear occurs no harm will follow, and the stimulation of the surrounding tissues, as previously outlined, may take place. Such wear is seldom seen.

It therefore follows that the element of excessive stress, once occurring in such mouths, is continued indefinitely. As it is practically never self-limiting, one of two things happens: (1) Given heavy alveolar support and high tissue resistance, with disproportionate stress, there occurs a disturbance of the pulp circulation; or (2) given a less highly organized alveolar support, with stress in excess of physiologic tolerance, disease of the periodontal tissues ensues.

The *modus operandi* of these two widely dissimilar pathologic phenomena has its starting point in a disturbance of circulation in the pericementum. When stress is brought to bear upon a tooth, whether normal or excessive, its primary effect is upon the pericementum. The compression and stretching of the pericemental fibres, as the tooth is pushed from side to side in its socket, as in lateral stress, affects first of all the blood vessels. The primary result of this circulatory change seems to be the production of a hyperæmia. In the type of tooth having a heavy alveolar support, this hyperæmia has its most marked manifestations at the apex of the tooth. It affects the pulp circulation, extending to it also a hyperæmia. This disturbance gives rise to sensitiveness, e.g., to thermal changes. It

may go on to the production of acute pain, characteristic of pulp disease; it may lead to the death of the pulp. Such cases are not uncommon in dental practice, and are difficult to diagnose on account of the absence of the better-understood and more exciting causes of such symptoms. If such teeth be treated in time by the correction of the traumatic occlusion, they will rapidly become comfortable through the subsidence of the symptoms of inflammation.

Where the alveolar support is inadequate, the pericemental hyperæmia seems to arouse the activity of bone-destroying cells, and alveolar resorption and rarefaction begins. As this occurs there is a structural change in the pericementum, with usually a perceptible congestion of the tissues near the alveolar crest. The congestion results in lowered resistance, and makes possible the entry of bacteria. With this event the complex process of periodontal disease is under way.—P. R. STILLMAN, D.D.S., F.A.C.D., and J. O. MCCALL, D.D.S., F.A.C.D. (*Dental Items of Interest*, May, 1927.)

The Microscopic Examination of Periapical Exudate

J. L. T. APPLETON, JNR., D.D.S.



THE dressing which has been sealed in the canal, with or without an antiseptic, is removed, and with it, a broad thin smear is made in a clean microscopic slide. This smear is allowed to dry, passed through the flame three times and then stained by any of the simple methods of staining bacteria. The ordinary solution of methylene blue is perfectly satisfactory. This stain is allowed to stay on for the necessary time, average about one minute. This stain is washed off in tap water, the film blotted dry and a small drop of cedar oil is put upon it. The examination is made with a 1.9 mm. objective. Two things are to be looked for: bacteria and pus cells. If bacteria are found they will usually be spheroidal in shape and grouped singly, in pairs, or in short chains. Occasionally rod forms, or diphtheroids may be seen. Pus cells are of the type of polymorphonuclear-neutrophil. Not infrequently, and particularly where dichloramine-T has been used, a few of these cells may be found, but whenever they are present in large numbers they represent the

persistence of infection. Therefore, when by this examination of the periapical exudate bacteria or pus cells are found, it is certain that bacteria are still present in the periapical tissues, and treatment, unless extraction is resorted to, is incomplete.

That these bacteria are not dead is proved by the fact that wherever cultures have been made from such cases, a growth is obtained. Whether these bacteria may be of reduced virulence it is not yet possible to say, but it is wise to regard the case as still requiring further treatment.

Is the number of bacteria found in these stained smears of any clinical significance? The number of bacteria seen in such a preparation does not serve as an index to the actual number of bacteria still persistent in the periapical tissues.

The finding of evidence indicating persistence of periapical infection distinctly contraindicates the filling of the canal. On the other hand, the failure to find bacteria or large numbers of pus cells on the slide does not in itself justify the filling of the canal. Bacteriological methods are useful in this connection by exerting a *veto* power. They can give real information when not to fill a canal, but, in themselves can never tell when to fill a canal.—(*Dental Items of Interest*, August, 1927).

Friends in Books

BUT granting that we had both the will and the sense to choose our friends well, how few of us have the power! or, at least, how limited, for most, is the sphere of choice! Nearly all our associations are determined by chance, or necessity; and restricted within a narrow circle. We cannot know whom we would; and those whom we know, we cannot have at our side when we most need them. All the higher circles of human intelligence are, to those beneath, only momentarily and partially open. We may, by good fortune, obtain a glimpse of a great poet, and hear the sound of his voice; or put a question to a man of science, and be answered good humouredly. We may intrude ten minutes' talk on a cabinet minister, answered probably with words worse than silence, being deceptive; or snatch, once or twice in our lives, the privilege of throwing a bouquet in the path of a princess, or arresting the kind glance of a Queen. And yet these momentary chances we covet; and spend our years, and passions, and powers in pursuit of

little more than these; while, meantime, there is a society continually open to us, of people who will talk to us as long as we like, whatever our rank or occupation;—talk to us in the best words they can choose, and of the things nearest their hearts. And this society, because it is so numerous and so gentle, and can be kept waiting round us all day long,—kings and statesmen lingering patiently, not to grant audience, but to gain it!—in those plainly furnished and narrow ante-rooms, our bookcase shelves,—we make no account of that company, —perhaps never listen to a word they would say, all day long! You may tell me, perhaps, or think within yourselves, that the apathy with which we regard this company of the noble, who are praying us to listen to them; and the passion with which we pursue the company, probably of the ignoble, who despise us, or who have nothing to teach us, are grounded in this,—that we can see the faces of living men, and it is themselves, and not their sayings, with which we desire to become familiar. But it is not so. Suppose you never were to see their faces:—suppose you could be put behind a screen in the statesman's cabinet, or the prince's chamber, would you not be glad to listen to their words, though you were forbidden to advance beyond the screen? And when the screen is only a little less, folded in two instead of four, and you can be hidden behind the cover of the two boards that bind a book, and listen all day long, not to the casual talk, but to the studied, determined, chosen addresses of the wisest of men;—this station of audience, and honourable privy council, you despise!

* * * *

The good book of the hour, then,—I do not speak of the bad ones—is simply the useful or pleasant talk of some person whom you cannot otherwise converse with, printed for you. Very useful often, telling you what you need to know; very pleasant often, as a sensible friend's present talk would be. Those bright accounts of travels; good-humoured and witty discussions of questions; lively or pathetic story-telling in the form of novel; firm fact-telling, by the real agents concerned in the events of passing history;—all these books of the hour, multiplying among us as education becomes more, are a peculiar possession of the present age; we ought to be entirely thankful for them, and entirely ashamed of ourselves if we make no good use of them.—*Ruskin*.

PUBLIC EDUCATION DENTAL HEALTH

"The public has decided it wants health talk and means to get it! The lay press is the most powerful medium of instruction for the public in health matters. We must do our best to secure its co-operation!"—Sir Thomas Horder.

IN this department each month will be published short articles suitable for use in the public press. The material has been authorized by the Oral Hygiene Committee of the Ontario Dental Association, and members of the profession may feel free to arrange for its publication in the local papers or magazines.

TISSUE TONE.



JUST what does the term imply? Well, doubtless at some time or other, you have had your doctor advise "that the system needed a general toning up." This should afford a clue as to the meaning.

Under conditions of normal life, as the tissues grow and perform their functions, worn-out cells die. As bone grows, it is absorbed little by little to make room for the remodelling and growth of the larger structure. Also, bacteria, ever present in the oral cavity, gain access beneath the protective covering of the mouth tissues.

However, Nature has made provision for the disposal of these worn-out fragments and foreign intruders, by the activities of certain lowly organized cells known as phagocytes.

In health, these little warriors are able to perform their functions of waste disposal and, as well, the more militant duties of combatting and destroying the invading organisms.

But with a lowered resistance of the body cells, through local or general disturbances, the defence is weakened, permitting in the one case a poisoning of the body tissues by the waste materials, and, in the other, the securing of a foothold by such bacteria as may have gained access to the tissues.

Among those factors tending towards this lowered vitality of the body cells, or, in other words "loss of tissue tone," may be cited: systemic diseases; influences exerted through nerve channels; and a poorly nourished blood supply.

But, possibly, in the mouth, the factors are more frequently local in nature, and generally result from oral neglect. These include irritations and injuries from wedging foods, deposits

of tartar and food debris, and the purely negative factor, the lack of proper masticatory exercise.

Corrective measures such as the use of harder foods requiring more vigorous chewing, and more careful attention to mouth toilet, will, in most cases, effectively restore the tissues to a healthy tone.

* * *

THE GINGIVÆ OR GUMS.



NATURE is a watchful Mother, and so it is that she has clothed the teeth with tissues that fit and wind about each tooth snugly like a protective garment.

These tissues, then, that so ably protect the delicate tooth membrane and supporting structures from exposure and injury, are spoken of as gingivæ or gums.

Among the tissues of the mouth, the gingivæ stand out in importance because of the fact that while in health they are barriers to disease, yet when injured they become the portals of entry to infective processes that are ever assailing the body defences.

For this reason, the maintenance of the gingivæ in health is of utmost importance.

These tissues have no direct attachment to the tooth at its neck, being simply fitted around closely; and they are so designed that food crushed between the teeth glides along their sloping surfaces to either side of the arch. Thus, all lodgments of debris which, in their decomposition, would give rise to offensive and disease producing compounds, are prevented.

Countless numbers of tiny fibres, embedded in the gingivæ, pass to and fro in all directions and give them their firmness and elasticity. Where suffering through injury, or other cause, these fibres become weakened, with consequent flabbiness of the gingivæ exhibiting a lack of tissue tone.

The gingivæ are particularly rich in blood supply, as is evidenced by their colour. By this means there is provided the rapid repair of tissue, following upon the frequent minor injuries and scraping that they are subjected to in the chewing of food.

Firm and resistant as are the gingivæ to minor injuries, yet where subjected to long-continued and repeated irritations, a mild inflammation is set up, which, progressing, leads to more serious disease that at once becomes a menace both to the teeth and to the health of the individual.

BLEEDING GUMS.



FROM their colour—which, in health varies from a light pink to a dark pink—you would know at once that the gum tissues are richly supplied with blood.

Nature has planned it so purposely, thus giving the oral tissues high regenerative powers, subject as they are daily to minor injuries and scrapings during the mastication of food.

Normally, gum tissue is firm and resistant, and will tolerate much abuse, without bleeding. But should there be an undue tendency of the gums to bleed, straightway this should be taken as a warning sign that something is wrong, and the family dentist consulted forthwith.

What, then, may be amiss?

Obviously these tissues are not in health, this being further manifested by a change in colour from pink to red, or to a purplish tinge, evidencing venous congestion.

Furthermore, the gingivæ may be swollen, or again, slightly shrunken at their crests, though in the early stages of gingival disease visible manifestations other than the tendency to bleed readily may not be present.

Perhaps the first intimation you have had of this condition was when one day, performing your mouth toilet, you noticed blood welling up freely around the necks of one or more teeth. So you sensed, and rightly, that the source of this hemorrhage was in the "pockets" underlying the free gum margin.

But why here?

The gum and gingival tissues are protected by a comparatively thick epithelial covering, but which becomes progressively thinner as it lines the side of the pocket until, at its deepest point, this covering is extremely light, or may be missing altogether.

Here, then, is the most vulnerable point of attack on the part of the disease bearing organisms which, gaining access to the tissues, through some cause, set up a mild degenerative process, with a consequent breaking down of the cell structures and weakening of the blood vessel walls.

So, that, with this condition present, even a mild stress on those weakened areas is sufficient to cause a hemorrhage.

There always is a reason for bleeding gums!

Officers of Canadian Dental Organizations

*Oral Health will be pleased to Receive Additions or Corrections that
Directory of Names May be Kept as Accurate as Possible.*



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ORAL HEALTH for December, 1927

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EDITORIAL

*Happy thoughts and kindly wishes
Mingle in a friendly way,
As they carry merry greetings
To you all on Christmas Day.*

George Frederick Clarke, Author and
Dentist



TO be an author with four novels accepted for publication in a little over two years, and from day to day meeting the responsibilities of a successful dental practice, is an accomplishment as unusual as it is outstanding. This is the record of Doctor George Frederick Clarke, of Woodstock, New Brunswick, whose evenings away from his writing-den are exceedingly few throughout

the winter months. Dr. Clarke graduated from the Philadelphia Dental College in 1913. Previous to his college course he had been writing short stories, poems, etc., from the time he was a boy. Since graduation he has been a prodigious worker, rewriting his first novel no less than seven times, seven years in succession. Such was the school in which he learned the technique of novel writing. The manuscript was put aside and another book commenced and finished. A little later a friend of Dr. Clarke's sent the second manuscript to the Dramatic Critic of the *London Morning Post*, who was so pleased with it that he took it to Curtis Brown, one of the most exclusive publishers' agents in the British Empire. Mills & Boon brought the book out in June, 1925, bearing the title of "The Magic Road." The following winter Blackie & Son published a boys' book written by Dr. Clarke, and the next year the book first written by the author was published. "Thetis Saxon" is the fourth of Dr. Clarke's books, it having been published in July of this year. It has been very favourably reviewed by various journals, including *St. John Times Globe*, *Toronto Saturday Night*, *Aberdeen Press*, Scotland, *The Bookseller*, London, England. These indicate that the characters are extremely interesting beings, and that the book will make its own way. However, in spite of the present achievements of Dr. Clarke, he is aiming higher, and modestly states that he hopes by the time he is sixty he shall have really done something worth while.

Doctor Clarke is married and has two charming little daughters. The oldest one, Jane, at twelve years has already found herself in print, having done two reviews for *Saturday Night's Children's Book Week*.

We hope many Canadian Dentists may some time have the privilege of knowing Dr. Clarke personally, and that most of us may learn to know him through his books, which come to us so well recommended.

Congratulations, Dr. Clarke!

Montreal Dental Assistants' Association



THE monthly meeting of the Montreal Dental Assistants' Association, held on November 21st, was well attended. The President, Miss R. Firth, was in the chair.

A report of the Detroit meeting of the American Dental

Assistants' Association was read by Miss Rachel Ratner, which was a great inspiration to the members and it is hoped will increase their future activities.

Dr. A. W. McClelland, Professor of Orthodontia, of the Faculty of Dentistry, presented phases of that subject of particular interest to members of the Association, and his address was much appreciated.

General Anaesthesia and Oral Sepsis



IN a recent issue of the *Lancet*, an article appears on the subject of the preparation of patients for operation, by Mr. W. E. M. Mitchell.

In reference to the dangers of performing operations in the presence of oral sepsis, he says:

"The attention to septic foci in the mouth and nose cannot be too meticulous, and it is nothing less than a surgical crime to perform an operation (other than an emergency one) with general anæsthesia in the presence of frank oral or nasal sepsis. This is said on account of the risk of pneumonia supervening in such cases. When dealing with what Mr. A. J. Walton has named the 'surgical dyspepsias,' the medical attendant doubtless will have eliminated any focus infection that he may have been able to discover; on the other hand, he may not have thought it worth while to treat dental sepsis in a patient awaiting such an operation as that for the radical cure of hernia. It is, however, to be insisted on that the risk from the anæsthetic is materially increased when it is administered through a cavity in which virulent pathogenic organisms abound."

Collecting Accounts



DOCTORS who neglect to push those who owe them money should see a moral in that one about Sam, the coloured man, who was asked to "drop a little change for the Lord" in the tambourine held out by the Salvation Army Nell to whose hymns he had just been listening.

Sam owed everybody in town, and when he refused to contribute, the Salvation lassie reminded him, "You owe it to the Lord."

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5 minutes after extraction, the socket has received the proper care, and case is ready for dismissal.

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Doctor! Why be careful of your technique, of your anesthetic, of your syringe?

then

Be careless with saliva, torn tissues and with water given as wash.

DRY SOCKET SPECIFIC will overcome your troubles
"The last act of a successful extraction is the care of the Socket"

Canadian Distributors—**The Ash-Temple Co., Ltd.**

Manufactured by
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Dentists Endorse New Antiseptic

Plenty of Good Words From the Profession for Dr. Chase's Every-Day Mouth Wash

For a year the dental practitioners of Canada have been trying out this new antiseptic lotion in private practice, and the verdict they present on its merits is one of high appreciation.

Letters such as the following from a prominent Ontario dentist are frequently received: "Referring to Dr. Chase's Every-Day Mouth Wash. No treatment was ever more welcome to my patients, especially following extraction. It is a fine sedative, analgesic, deodorant and disinfectant in such cases."

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An
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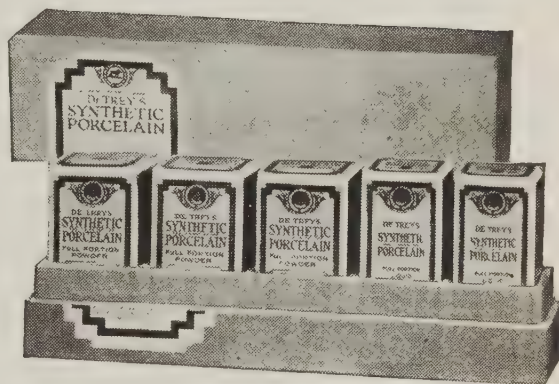
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8



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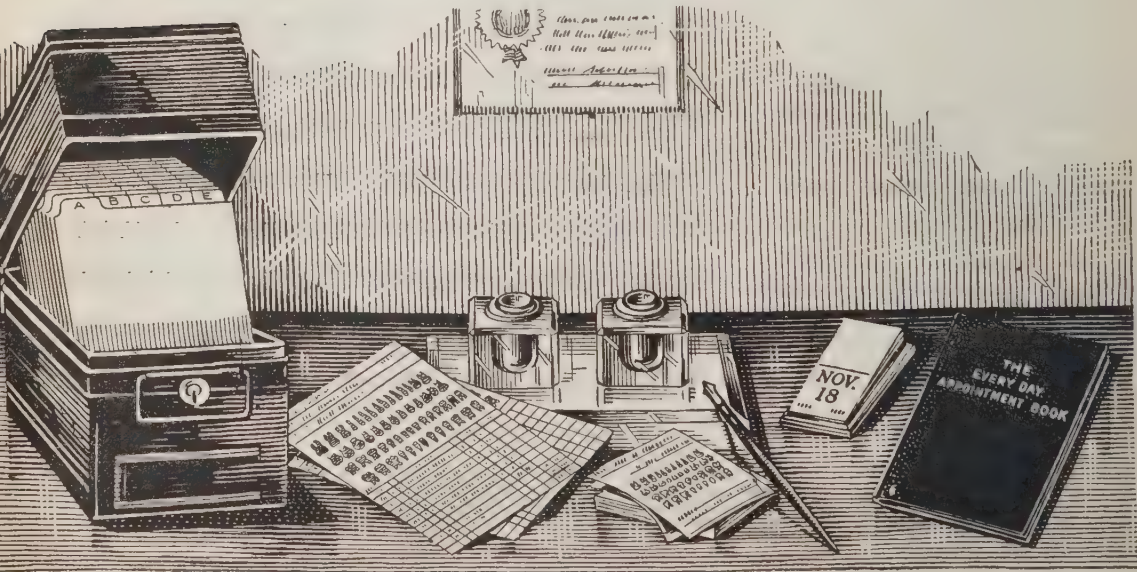
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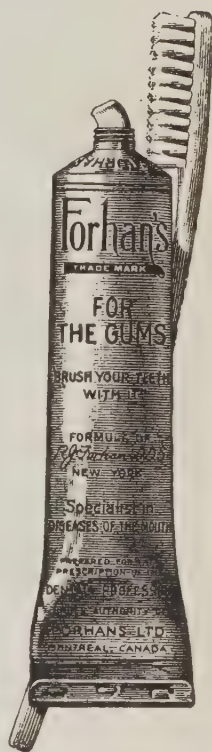
In broadcasting the importance of preventive oral hygiene, Forhan advertising stresses the im-

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Forhan's Pyorrhea Astringent is a recognized healing adjunct in the successful treatment of Pyorrhetic conditions. Its use is restricted solely to dentists.

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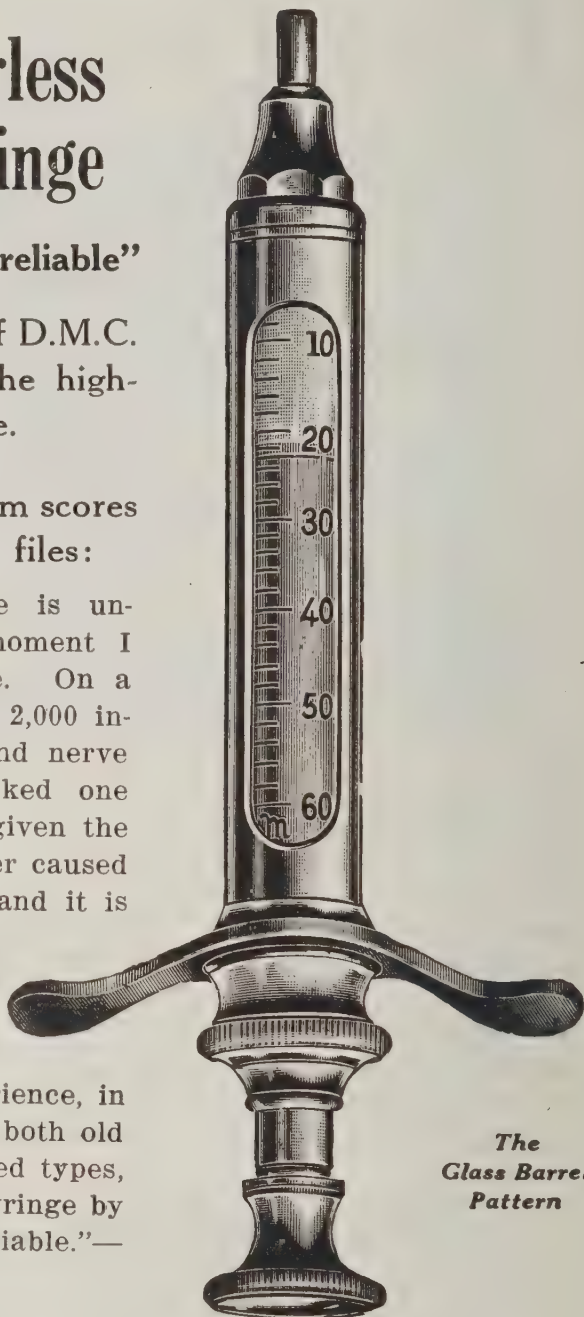
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May we send you a full-size tube to try, together with recent data and literature? Just mail the coupon.

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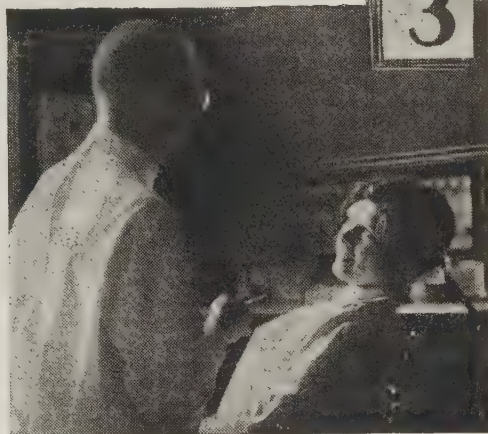
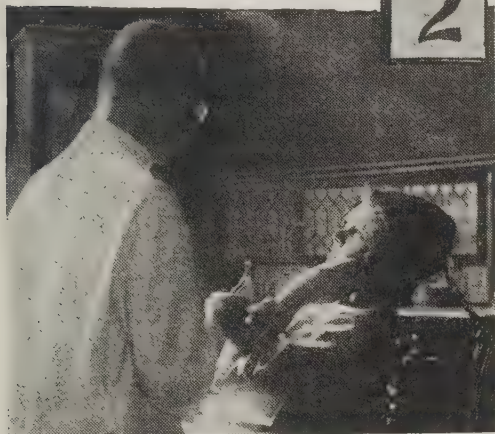
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Use any other anesthetic than Waite's one day—



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Immediate anesthesia in infiltration; only 3 to 5 minutes' wait in nerve-blocking.

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Unusual freedom from post-operative pain, sloughing and similar after-effects.

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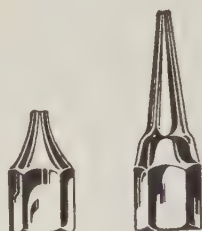
Because of the small percentage and volume used many find Butyn to be less expensive than other anesthetics.

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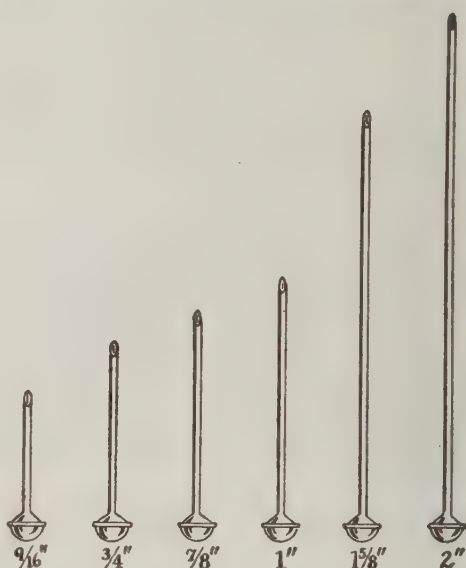
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THE ABBOTT LABORATORIES

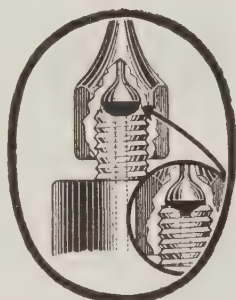
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Because of the importance of the concave seat for a leak-proof seal, best results can be obtained from R & R Schimmel Needles only when R & R Chucks are used.



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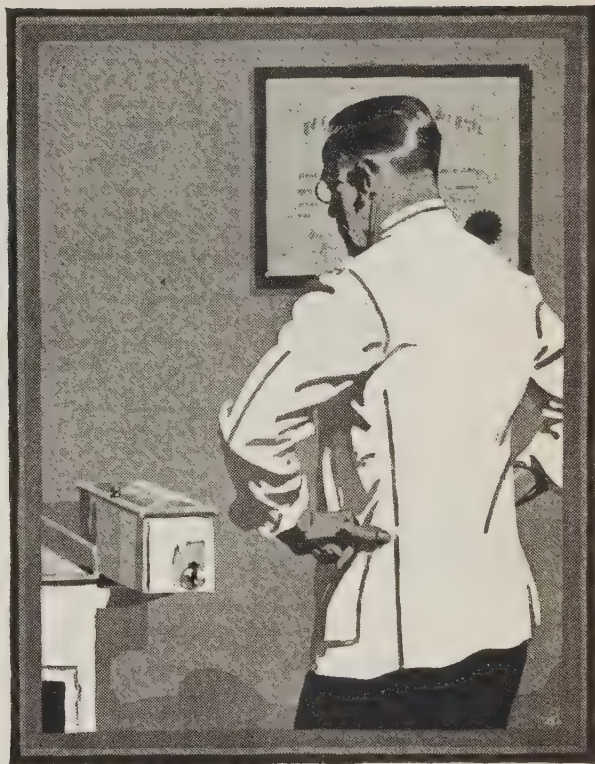
Consists of a soft metal ball, the upper half of which is encased in a hard metal shield which prevents jamming as the chuck is screwed down. No wrench is necessary. The soft metal spreads and seats itself firmly and positively against the end of the syringe. This type of seal is being widely imitated. For your protection, demand genuine R & R Schimmel Needles.

No finer needles are available to the dentist for general use with standard-thread syringes. They are hand-finished and microscopically inspected before being sterile-packed in glass vials containing 12 needles each. Steel, nickel and iridio-platinum in the lengths illustrated, 25 gauge. Also 23 gauge, $1\frac{5}{8}$ in. and 2 in. Special 19 gauge, $1\frac{5}{8}$ in., steel only.

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— or does it
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Does your sterilizer boil too fast and then too slow; does it require turning down and turning up; is it always ready for actual and safe sterilization, or do you wait for it to be just right?

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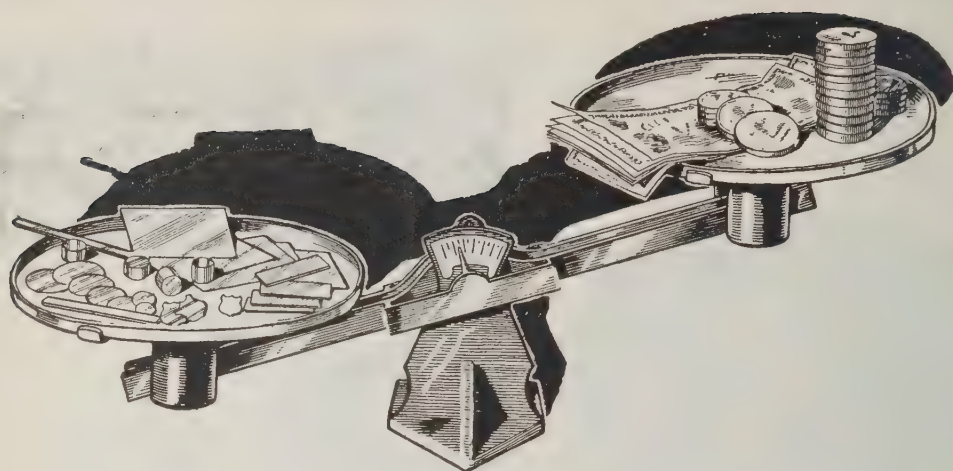
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Many Happy New Years,
Unbroken friendships,
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Affection on earth and
Heaven at last for all of us.

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Hundreds of dentists have written us telling us how much Somnoform has done for them. It is easy to learn to use it properly and to get results that will please you and please your patients.

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Always the same.
Retains its porosity
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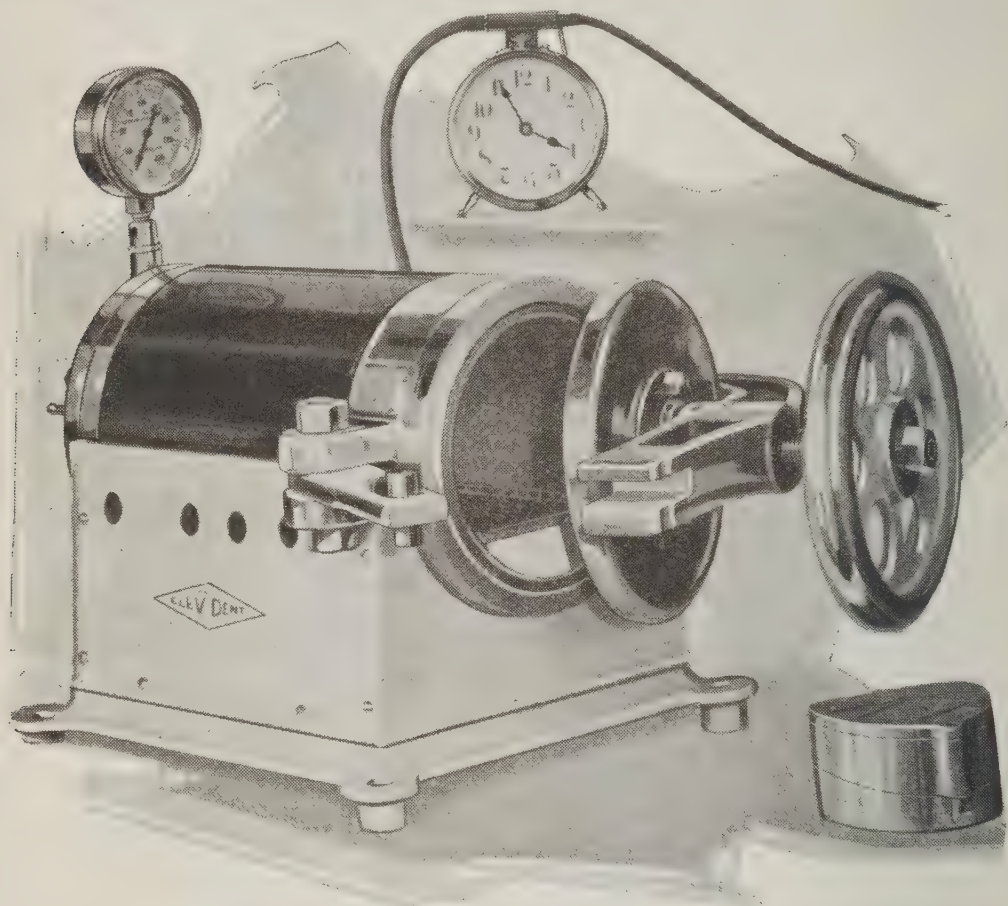
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A complete description of the Furnas Vulcanizer will be sent on request

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Nothing so quickly destroys pus and nothing so reliably neutralizes and destroys poisonous toxins, the really dangerous products of germ activities.

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A sample will gladly be sent on request

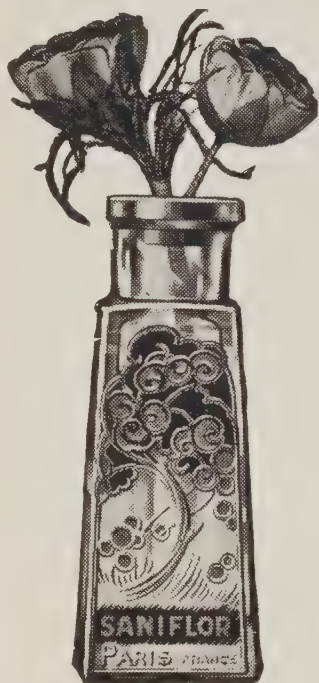
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Complete as Illustrated

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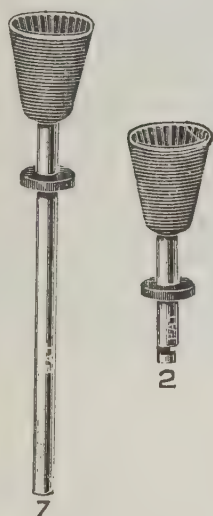
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Per Dozen . . . \$0.80	Per Dozen . . . \$ 1.05
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In 1923 Five years ago, the Vitalitester was submitted for the approval of leading Dental Educators for accurately determining pulp vitality.

TO-DAY, the Vitalitester is recommended by all who have had an opportunity to investigate its merits. When used properly it is 100% reliable and safe!



Cameron's Dental Diagnostoset

An Eminent Canadian Dentist writes:—

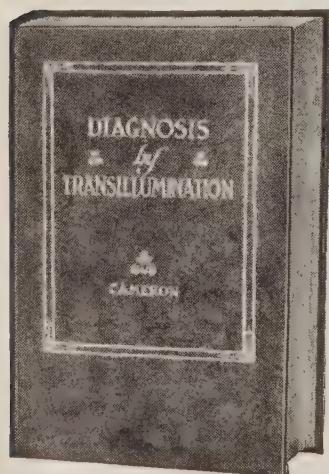
"—I have used Cameron's Dentalamp and Cameron's Dental Diagnostoset for many years in the past, and am using it now with the same great satisfaction.

"I can recommend your equipment to any who desire a standard outfit."

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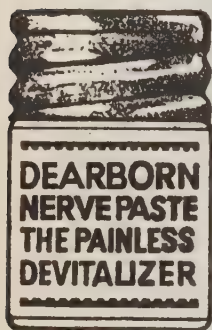
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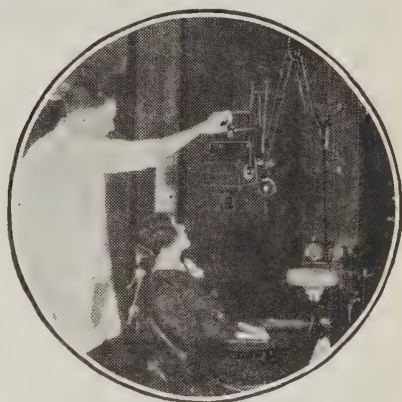
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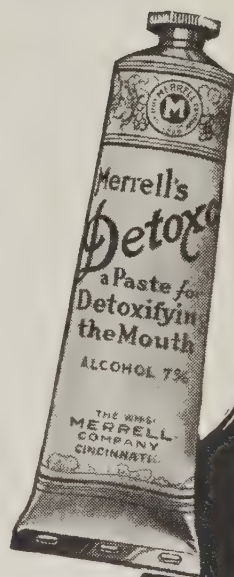
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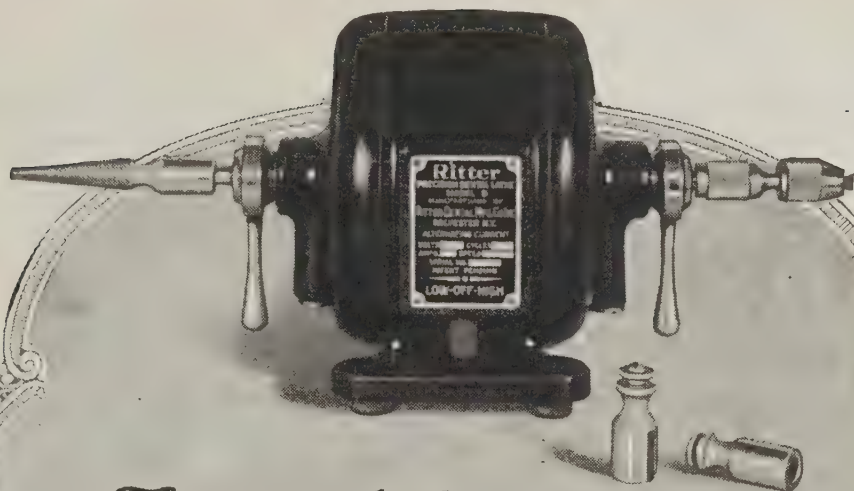
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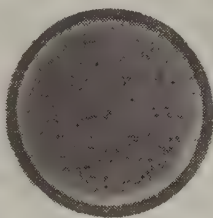
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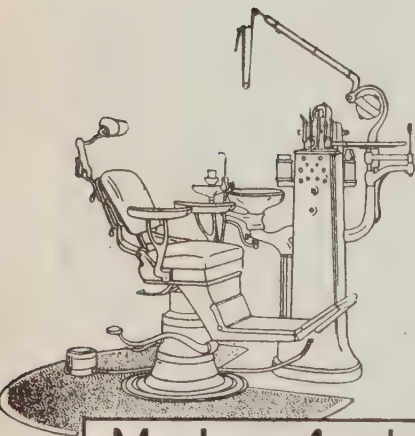
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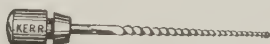
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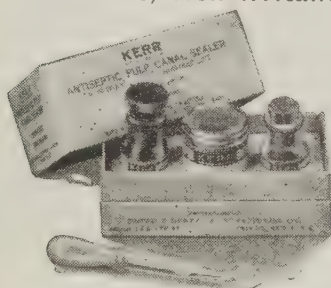
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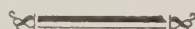
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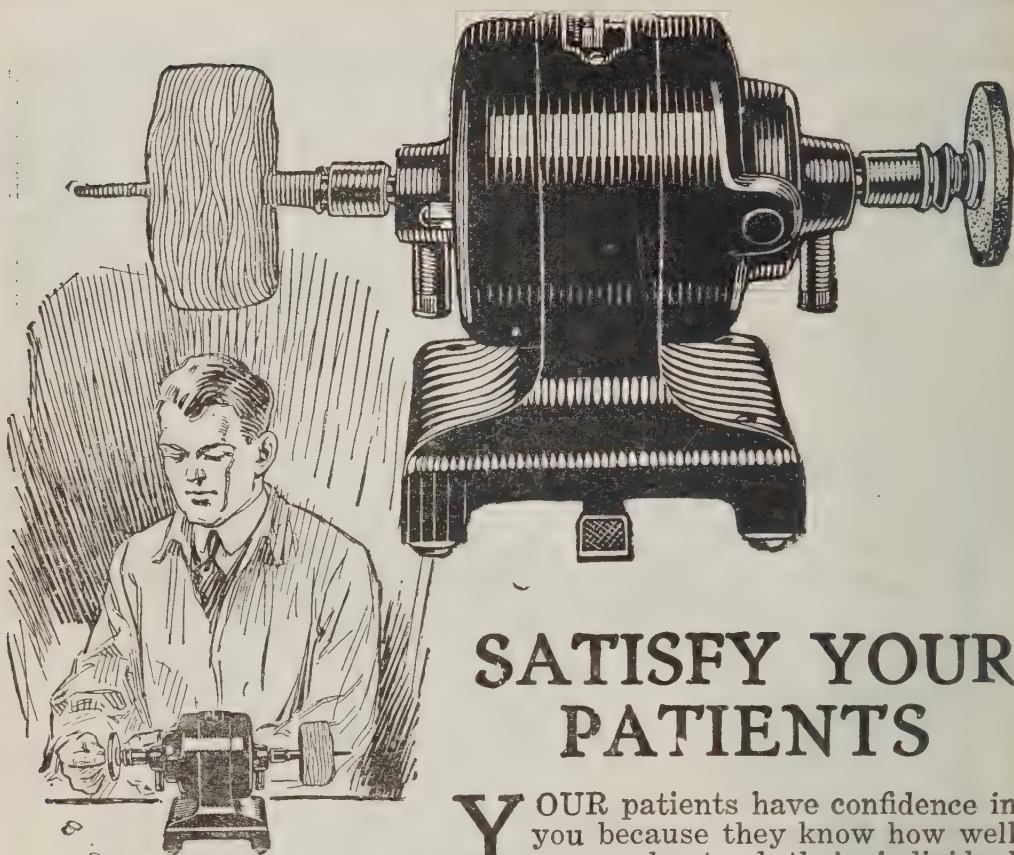
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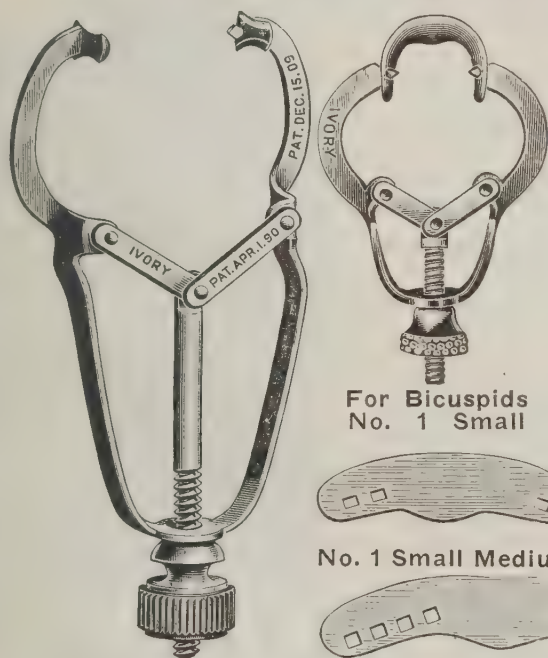
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